PROPOSED ENDORSEMENT OF CALIFORNIA TROPICAL FOREST STANDARD

Final Environmental Analysis

State of California
AIR RESOURCES BOARD

Release Date: November 9, 2018

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ATTACHMENTS

LIST OF ABBREVIATIONS

2010 FED	Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms as part of its adoption in 2010-2011
AB	Assembly Bill
CARB or Board	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHP	Combined Heat and Power
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change
EA	Environmental Analysis
EIR	environmental impact report
GCF	Governors' Climate and Forests Task Force
GHG	greenhouse gas
HFC	hydrofluorocarbon
ISOR	Initial Statement of Reasons
LCFS	Low Carbon Fuel Standard
$MTCO_2e$	metric tons of carbon dioxide equivalent
N_2	nitrogen
N_2O	nitrous oxide
N_2O_4	nitrogen tetroxide
NEPA	National Environmental Policy Act
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
PRC	Public Resources Code
Proposed Project	Proposed Endorsement of California Tropical Forest Standard

REDD	Reduced Emissions from Deforestation and forest Degradation (an acronym describing action that has been utilized in the United Nations Framework Convention on Climate Change decisions)
ROW	REDD Offset Working Group
RPS	Renewable Portfolio Standard
SB	Senate Bill
Scoping Plan	Climate Change Scoping Plan
SIP	State Implementation Plan
UNFCCC	United Nations Framework Convention on Climate Change
U.S. EPA	U.S. Environmental Protection Agency
USC	United States Code

The California Air Resources Board (CARB) released a Draft Environmental Analysis (Draft EA) for the Endorsement of the California Tropical Forestry Standard (Proposed Project) on September 14, 2018, for a 45-day public review and comment period that concluded October 27, 2018. During the public comment period for the Proposed Project, 76 unique comment letters were received.[1] Seven additional letters were received after the close of the comment period resulting in a total of 83 unique comment letters received on the Proposed Project, 11 of which were determined to raise significant environmental issues related to the analysis in the Draft EA and are responded to in this document.

In response to comments received during the 45-day comment period, CARB staff has made revisions to the California Tropical Forest Standard to clarify, bolster, and strengthen various provisions of the Standard. CARB staff made minor modifications to the Draft EA to create the Final EA. To facilitate identifying modifications to the document, modified text is presented in the Final EA with ~~strike-through~~ for deletions and <u>underline</u> for additions. None of the modifications alter any of the types of foreseeable compliance responses evaluated or conclusions reached in the Draft EA, introduce new significant effects on the environment, or provide new information of substantial importance relative to the EA. As a result, these revisions do not require recirculation of the draft document pursuant to the California Environmental Quality Act (CEQA) Guidelines, California Code of Regulations, title 14, section 15088.5, before consideration by the Board.

Based on multiple stakeholder comments, one of the revisions to the Standard has been to clarify that it could be modified as appropriate to apply to national jurisdictions that have developed country-scale programs to reduce emissions from deforestation and degradation, if applicable, and which are seeking to link their programs to an emissions trading system or other GHG emissions reduction program that focuses on national level-accounting. CARB staff notes that it is too speculative to determine how many jurisdictions, national or subnational, may utilize the standard, but the compliance responses at both scales remain the same. And, even if more national governments were to utilize the standard than subnational governments, adoption of compliance responses at the national scale may amplify the environmental benefits of the Proposed Project.

[1] Several of these letters were also submitted as part of action alerts by various environmental organizations (e.g., Amazon Watch, Center for Biological Diversity, Environmental Defense Fund, and Friends of the Earth). These various action alerts resulted in approximately 21,000 comments submitted into the public record.

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1.0 INTRODUCTION AND BACKGROUND

A. Introduction

This ~~Draft~~ Final Environmental Analysis (~~Draft~~Final EA) is prepared for the California Air Resources Board (CARB or Board) notice regarding the proposed Board endorsement of the California Tropical Forest Standard ("Proposed Project"). The Proposed Project does not result in any regulatory action, nor does it affect any other CARB program. Although the California Tropical Forest Standard could potentially be proposed for incorporation into the Cap-and-Trade Program through a future regulatory amendment process, the standard is intended to serve as a robust model for other emission mitigation programs and emission trading systems that are seeking to assess and potentially include jurisdiction-scale programs that reduce emissions from tropical deforestation and thereby incentivize substantial greenhouse gas (GHG) emission reductions caused by tropical deforestation. The Project Description section of this ~~Draft~~Final EA presents a detailed summary of the Proposed Project, as defined under the California Environmental Quality Act (CEQA). A description of the Proposed Project ~~is~~ was also included in the Notice for this action, released on September14, 2018, which is hereby incorporated by reference.

This ~~Draft~~Final EA is intended to disclose potential adverse environmental impacts, when taking a conservative view, of the Proposed Project and identify potential mitigation measures, if significant environmental impacts are identified. The Proposed Project is intended to generate environmental benefits pertaining to agriculture and forestry resources (through improved forest management) and GHG emission reductions. However, in some cases, as described in Chapter 4 of this ~~Draft~~Final EA, less than significant or potentially significant effects to environmental resources may occur, when viewed through a conservative lens, as a result of implementation of reasonably foreseeable compliance responses associated with the Proposed Project. It is expected that these potentially significant impacts could be feasibly avoided or mitigated to a less-than-significant level through jurisdiction-level environmental review associated with compliance responses and the attendant compliance with local, regional, and other laws and regulations. The ~~Draft~~Final EA takes the conservative approach in its post-mitigation significance conclusions (i.e., assuming that mitigation may not be sufficient or may not be implemented by other parties) and discloses, for CEQA compliance purposes, that potentially significant environmental impacts may be significant and unavoidable.

B. Background Information on California Tropical Forest Standard

Recognizing that addressing climate change requires a comprehensive look at the causes of greenhouse gas (GHG) emissions, Assembly Bill 32 (AB 32; Chapter 488, Statutes of 2006) directed CARB to consult with the federal government and other jurisdictions to identify the most effective strategies and methods to reduce GHGs, manage GHG control programs, and to facilitate the development of integrated and cost-effective regional, national, and international GHG reduction programs. CARB began assessing emerging international mitigation actions as it developed the AB 32

Climate Change Scoping Plan in 2008 and the California Cap-and-Trade Program (adopted in 2011). One of the most studied sectors within which mitigation actions have been proposed internationally has been tropical forests. Emissions from the deforestation and degradation of tropical forests account for an estimated 11-14% of all global CO_2 emissions.[2] (IPCC 2014; UNEP 2012; Harris et al. 2012) Given the scale of GHG emissions from tropical deforestation, robust climate efforts must include mechanisms to reduce these emissions.

In addition, pursuant to AB 32, Senate Bill (SB) 32 (Chapter 249, Statutes of 2016), and AB 398 (Chapter 135, Statutes of 2017), on December 14, 2017, the Board unanimously approved the 2017 Climate Change Scoping Plan (CARB 2017d), which sets out specific measures to accomplish California's plan to reduce GHG emissions an additional 40 percent below 1990 levels by 2030. The 2017 Climate Change Scoping Plan specifies that "[c]ontinued collaboration on efforts to reduce emissions from tropical deforestation and to evaluate sector-based offset programs, such as the jurisdictional program in Acre, Brazil, further demonstrates California's ongoing climate leadership and fosters partnerships on mutually beneficial low-emissions development initiatives."

In this vein, the California Tropical Forest Standard that forms the basis of the Proposed Project would specify criteria to assess jurisdictional sector-based offset crediting programs that reduce emissions from tropical deforestation for immediate use by jurisdictions across the globe that are taking action to reduce GHG emissions from tropical deforestation as well as potential future inclusion within a Cap-and-Trade Program. Much the same as other California international leadership initiatives,[3] this jurisdictional approach to tropical forest programs is anticipated to serve as a robust, replicable model for other GHG emissions mitigation programs such as the International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and other emerging programs.

Such a standard would also leverage nearly a decade of work of the California-founded Governors' Climate and Forests (GCF) Task Force[4] and build on Under 2 MOU commitments.[5] The standard expands upon existing norms and requirements from the United Nations and other international bodies such as the World Bank's Forest Carbon Partnership Facility and Carbon Fund, previous staff work evaluating expert recommendations and public input, voluntary carbon market tools and efforts, and GCF Task Force member programs. In brief, the standard establishes minimum criteria

[2] The IPCC's Working Group III found that emissions from the forest sector accounted for an estimated 12% of global emissions from 2000-2009, and about a third of anthropogenic CO2 emissions from 1750-2011. The United Nations Environment Program (UNEP) estimates that 11% of global emissions in 2008 were from tropical deforestation alone. Other researchers found an upwards range of closer to 14% of global greenhouse gas emissions coming from tropical deforestation between 2000 and 2005.

[3] For example, California's Short-Lived Climate Pollutant Reduction Strategy was developed to "serve as a model for action for other countries and jurisdictions to accelerate their progress to reduce emissions." *See* California Short-Lived Climate Pollutant Reduction Strategy, March 2017, *available at* https://www.arb.ca.gov/cc/shortlived/meetings/03142017/final_slcp_report.pdf.

[4] *See* https://gcftf.org/.

[5] *See* https://www.under2coalition.org/.

jurisdictions should consider including in a sector-based crediting program to be assessed by California or other similar emissions trading systems seeking to use the standard.

California has already developed one of the world's leading forest carbon offset programs within the United States to incentivize improved forest management, increase reforestation, and avoid substantial amounts of deforestation from land conversion. These efforts have resulted from CARB's adoption and implementation of the Compliance Offset Protocol for U.S. Forest Projects within the California Cap-and-Trade Regulation, which has generated more than 110~~90~~ million $MTCO_2e$ in reductions from projects in the United States. One of the most significant additional actions that California can take on forests globally would be to establish a credible and robust standard for addressing tropical deforestation. Staff is proposing for Board consideration and endorsement a sector-based offset credit standard which would include regulatory-grade criteria for assessing jurisdiction-scale programs that reduce emissions from tropical deforestation.

CARB staff has been working on developing a jurisdictional standard for nearly a decade. This work commenced with the 2008 Scoping Plan and the creation of the GCF Task Force. It has continued through the updates to the Scoping Plan, a set of expert recommendations presented to California,[6] and through workshops related to the Cap-and-Trade Regulation. CARB included a regulatory signal within its Cap-and-Trade Regulation in 2010 to demonstrate California's commitment to better understanding efforts to reduce emissions from tropical deforestation and how they might be credited in a market-based program (see sections 95991-95995 of the Regulation). Under these provisions, CARB expressed its interest in assessing "sector-based crediting programs." Section 95802 of the Regulation defines sector-based crediting programs as "a GHG emissions-reduction crediting mechanism established by a country, region, or subnational jurisdiction in a developing country and covering a particular economic sector within that jurisdiction. A program's performance is based on achievement toward an emissions-reduction target for the particular sector within the boundary of the jurisdiction."

All of this work was detailed in a CARB staff concept paper (CARB 2015) and discussed in four public workshops in 2015 and 2016.[7] These workshops included discussions of

[6] These recommendations were presented by the REDD Offset Working Group, which was made up of technical experts on topics ranging from aerial mapping to on-the-ground forest management and from local community engagement to market design. These experts worked for nearly two years on developing a set of recommendations regarding how the states could integrate avoided tropical deforestation into their climate programs. The final recommendations were submitted to CARB on July 18, 2013 and are available at https://www.arb.ca.gov/cc/capandtrade/sectorbasedoffsets/row-final-recommendations.pdf.

[7] The proposed standard has been informed by input received in four public workshops that were held on October 28, 2015, March 22, 2016, April 5, 2016, and April 28, 2016 to discuss technical and policy topics related to developing a standard for assessing programs that reduce emissions from tropical

norms and requirements from the United Nations and other international bodies such as the World Bank's Forest Carbon Partnership Facility and Carbon Fund, voluntary carbon market organizations, and efforts from within the GCF Task Force member states and provinces. Specific topics discussed during the workshops included sector-based crediting program scope, reference levels, crediting baselines, reporting requirements, reversals, leakage risk, credit tracking, verification, and social and environmental safeguards. Staff considered all of these materials, as well as ongoing engagement with other GCF Task Force jurisdictions, in developing the Proposed Project. As a result, the Proposed Project provides detailed criteria that emissions trading systems (both international and California-based) could potentially use to assess sector-based offset crediting programs. It should be noted, while work to develop a standard was commenced in the context of the Cap-and-Trade Program, this standard is not limited for use in just an emissions trading system and could support other types of investments to bolster efforts to address deforestation.

It should also be noted that the standard that forms the basis of the Proposed Project would not result in any linkage with any jurisdiction, nor would it allow any tropical forest offsets into the Cap-and-Trade Program without a future regulatory amendment process to incorporate the standard into the Cap-and-Trade Regulation and conduct linkage findings pursuant to Senate Bill 1018 (Chapter 39, Statutes of 2012), which would undergo its own public process under the Administrative Procedure Act and CEQA.

C. Environmental Review Process

1. Requirements under the California Air Resources Board Certified Regulatory Program

CARB is the lead agency for the Proposed Project, and it has prepared this ~~Draft~~Final EA pursuant to its CEQA certified regulatory program. Public Resources Code (PRC) Section 21080.5 allows public agencies with regulatory programs to prepare a functionally equivalent substitute document in lieu of an environmental impact report or negative declaration once the program has been certified by the Secretary for Resources Agency as meeting the requirements of CEQA. CARB's regulatory program was certified by the Secretary of the Resources Agency in 1978 (14 California Code of Regulations [CCR] Section 15251(d)). As required by CARB's certified regulatory program and the policy and substantive requirements of CEQA, CARB has prepared this ~~Draft~~Final EA to assess the potential for significant adverse and beneficial environmental impacts associated with the proposed actions and to provide a succinct analysis of those impacts (17 CCR Sections 60005(a) and (b)). The resource areas from the CEQA Guidelines (14 CCR Section 15000 et. seq.) Environmental Checklist (Appendix G) were used as a framework for assessing potentially significant impacts.

deforestation. For more information, workshop comments, presentations and other materials can be found on the Cap-and-Trade website at https://www.arb.ca.gov/cc/capandtrade/meetings/meetings.htm.

At the outset, CARB notes it is unclear whether the proposed Board endorsement of the California Tropical Forest Standard constitutes a "project approval" subject to CEQA in the first instance. The CEQA Guidelines define a "project" as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and that is … an activity directly undertaken by any public agency." (14 CCR Section 15378(a)). "The term "approval" refers to a public agency decision that "commits the agency to a definite course of action in regard to a project." (14 CCR Section 15352(a).) Here, the Board's endorsement of the California Tropical Forest Standard is not a commitment to a specific course of action, as CARB lacks authority to require any other jurisdictions to use it, and it has not been proposed for incorporation into CARB's Cap-and-Trade Program or any other regulatory program. Importantly, the Proposed Project would not result in any linkage with any jurisdiction, nor would it allow any tropical forest offsets into the Cap-and-Trade Program without a future regulatory amendment process to consider incorporating the standard into the Cap-and-Trade Regulation and conduct linkage findings pursuant to SB 1018. Additionally, essentially all impacts that could result from the Proposed Project would take place outside the United States, and therefore the extent to which they must be analyzed under CEQA is unclear. Furthermore, CARB's endorsement, even if viewed as a "project" under a conservative lens, is appropriately considered exempt from CEQA as an action taken by a regulatory agency for protection of the environment. (See 14 CCR Section 15308.) Nevertheless, given the broad public interest in this proposal, CARB has conservatively decided to prepare this ~~Draft~~Final EA.

Although the policy aspects of the Proposed Project do not directly change the physical environment, physical changes to the environment could result from reasonably foreseeable compliance responses taken because of implementation of the actions identified in the Proposed Project.

2. Scope of Analysis and Assumptions

The degree of specificity required in a CEQA document corresponds to the degree of specificity inherent in the underlying activity it evaluates. An environmental analysis for broad programs will necessarily be less detailed than that for a specific project (14 CCR Section 15146). For example, the assessment of a particular construction project would naturally be more detailed than one concerning the adoption of a local general plan because the construction effects can be predicted with a greater degree of accuracy (14 CCR Section 15146 (a)). This analysis addresses a broad, non-regulatory standard, so a general level of detail is appropriate. However, this ~~Draft~~Final EA makes a rigorous effort to evaluate significant adverse impacts and beneficial impacts of the proposed standard and contains as much information about those impacts as is currently available, without being unduly speculative.

The scope of analysis in this ~~Draft~~Final EA is intended to help focus public review and comments on the Proposed Project, and ultimately to inform the Board of the environmental benefits and adverse impacts before Board action on the proposal. This analysis focuses on reasonably foreseeable potentially significant adverse and

beneficial impacts on the physical environment resulting from reasonably foreseeable compliance responses taken in response to implementation of the proposed actions within the Proposed Project. As used in this ~~Draft~~Final EA, the term "compliance responses" refers to the reasonably foreseeable activities that may occur in response to the provisions of the Proposed Project, including any mandatory (i.e., compliance with implementing jurisdiction program requirements) and voluntary (e.g., development of emission reduction activities seeking sector-based offset credits) aspects of the Proposed Project.

The analysis of potentially significant adverse environmental impacts from the Proposed Project is based on the following assumptions:

1. The analysis addresses the potentially significant adverse environmental impacts resulting from implementing the Proposed Project compared to existing conditions.

2. The analysis of environmental impacts and determinations of significance are based on reasonably foreseeable compliance responses taken in response to implementation of the Proposed Project.

3. The analysis in this ~~Draft~~Final EA addresses environmental impacts within California and outside the State to the extent they are reasonably foreseeable and do not require speculation.

4. The level of detail of impact analysis is necessarily and appropriately general because the Proposed Project is programmatic.

5. This ~~Draft~~Final EA does examine regional and local environmental issues to the degree feasible where appropriate. As a result, the impact conclusions in the resource-oriented sections of Chapter 4, Impact Analysis and Mitigation Measures, cover broad types of impacts, considering the potential effects of the full range of reasonably foreseeable actions undertaken in response to the Proposed Project.

D. Organization of the Environmental Analysis

The ~~Draft~~Final EA is organized into the following chapters to assist the reader in obtaining information about the Proposed Project and specific environmental issues.

- Chapter 1, Introduction and Background – provides a project overview, background information, and other introductory material.
- Chapter 2, Project Description – summarizes the Proposed Project, implementation assumptions, and reasonably foreseeable compliance responses taken in response to the Proposed Project.
- Chapter 3, Environmental and Regulatory Setting, in combination with Attachment A – contains the environmental setting and regulatory framework relevant to the environmental analysis of the Proposed Project.

- Chapter 4, Impact Analysis and Mitigation – identifies the potential environmental impacts associated with the Proposed Project and mitigation measures for each resource impact area.
- Chapter 5, Cumulative and Growth-Inducing Impacts – identifies the cumulative effects of implementing the Proposed Project against a backdrop of past, present, and reasonably foreseeable future projects.
- Chapter 6, Mandatory Findings of Significance – discusses whether the Proposed Project has the potential to degrade the quality of the environment, cause substantial adverse impacts on human beings, and cause cumulatively considerable environmental impacts.
- Chapter 7, Alternatives Analysis – discusses a reasonable range of potentially feasible alternatives that could reduce or eliminate adverse environmental impacts associated with the Proposed Project.
- Chapter 8, References – identifies sources of information used in this ~~Draft~~Final EA.

E. Public Review Process for the Environmental Analysis

In accordance with CARB's certified regulatory program, and consistent with CARB's commitment to public review and input on its proposed actions, this ~~Draft~~Final EA is subject to a public review process through the posting of the Proposed Project along with this ~~Draft~~Final EA for a public review period that ~~begins~~began on September 14, 2018 and ends on October 29, 2018.

At the end of the public review period, CARB ~~will~~ prepared written responses to environmental comments received on the Draft EA and revised the Draft EA, as necessary. The Final EA and the written responses to environmental comments will be considered by the Board at a public hearing later in November 2018. If the Proposed Project is approved, a Notice of Decision will be posted on CARB's website and filed with the Secretary for Natural Resources. (17 CCR Section 60007 (b)).

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2.0 PROJECT DESCRIPTION

For the purposes of this ~~Draft~~Final Environmental Analysis (~~Draft~~Final EA), the California Air Resources Board (CARB or Board) considers the recommended actions in the proposed California Tropical Forest Standard to be the "project" evaluated under the California Environmental Quality Act (CEQA). CEQA defines a "project" as a discretionary action that has the potential to result in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment. (14 California Code of Regulations [CCR] Section 15378.) Here, the reasonably foreseeable compliance actions taken in response to implementation of the Proposed Project have the potential to result in either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

The Proposed Project would be to endorse the proposed California Tropical Forest Standard through a non-regulatory action, which could be proposed for incorporation by other emission mitigation programs. It could also potentially eventually be incorporated into the California Cap-and-Trade Regulation through a future rulemaking which would undergo its own CEQA analysis and regulatory process. Such incorporation, if it were to occur, would be in the form of a potential future CARB staff proposal to the Board, which the Board would need to consider and exercise its own independent judgment in deciding whether to approve or deny the staff proposal. The elements of the Proposed Project are discussed in the following sections.

A. Project Objectives

The primary objectives of the Proposed Project are listed below:

1. Facilitate Integrated and Cost-Effective Regional, National ,and International Greenhouse Gas (GHG) Reduction Programs Pursuant to AB 32

Recognizing that addressing climate change requires a comprehensive look at the causes of greenhouse gas (GHG) emissions, AB 32 directed CARB to consult with the federal government and other jurisdictions to identify the most effective strategies and methods to reduce GHGs, manage GHG control programs, and to facilitate the development of integrated and cost-effective regional, national, and international GHG reduction programs. CARB began assessing emerging international mitigation actions as it developed the AB 32 Climate Change Scoping Plan in 2008 and the California Cap-and-Trade Program (adopted in 2011). One of the most studied sectors within which mitigation actions have been proposed internationally has been tropical forests.

Emissions from the deforestation and degradation of tropical forests accounts for an estimated 11-14% of all global CO_2 emissions. (IPCC 2014; UNEP 2012; Harris et al. 2012) Given the scale of GHG emissions from tropical deforestation, robust climate efforts must include mechanisms to reduce these emissions. The California Tropical Forest Standard that forms the basis of the Proposed Project specifies criteria to assess jurisdictional sector-based offset crediting programs that reduce emissions from tropical

deforestation for immediate use by jurisdictions across the globe that are taking action to reduce GHG emissions from tropical deforestation as well as potential future inclusion within a cap-and-trade or other GHG mitigation program.

2. Incentivize Reductions of GHG Emissions from a Major Source of Emissions Worldwide – Tropical Deforestation

As a source and a sink of GHG emissions, forests provide one of the only opportunities (1) to simultaneously reduce a substantial amount of carbon dioxide (CO2) being emitted to the atmosphere due to deforestation and forest degradation from certain management activities, wildfire, and land use change, and (2) to actively remove CO2 from the atmosphere and store it in the form of above-ground and below-ground carbon. The Intergovernmental Panel on Climate Change (IPCC) has suggested that sustainable forest management is the single largest opportunity for sustained GHG mitigation benefit. Many forest-based mitigation actions offer some of the most cost-effective climate mitigation opportunities available that also provide synergies with adaptation and sustainable development, both internationally and domestically.

In the Paris climate agreement, the international community committed to keep global warming well below 2°C by achieving a balance between anthropogenic emissions and carbon sequestration in the second half of the century. This aggressive goal cannot be achieved without significant efforts to protect and restore the world's forests. Emissions from the deforestation and degradation of the world's forests are estimated to account for between 11% and 14% of total global emissions. (IPCC 2014; UNEP 2012; Harris et al. 2012) Climate change compounds impacts on forests and will result in less resilient, more vulnerable forests, further exacerbating these emissions. Without significant reductions in emissions and increases in carbon sequestration from forests and land use, the world will not meet the goals of the Paris Agreement, and California will miss a critical opportunity to further long-term climate goals. By taking action to reduce emissions from deforestation, combined with their sequestration potential, forests may account for as much as 50 percent of the climate mitigation solution to stabilize atmospheric CO_2 on a global scale.[8] (Goodman and Herold 2014; Houghton et al. 2015)

3. Establish Robust Criteria for Emissions Trading Systems to Assess, and Potentially Include, Jurisdiction-Scale Programs that Reduce GHG Emissions from Tropical Deforestation

The Proposed Project would specify regulation-grade criteria to assess jurisdictional sector-based offset crediting programs that reduce emissions from tropical deforestation. This standard would build on existing best-practice standards and international actions to develop transparent programs that reduce tropical deforestation, include direct participation by and benefits to indigenous peoples and local

[8] Goodman and Herold found that as much as 24-30 percent of total mitigation potential can be provided by halting and reversing tropical deforestation. Houghton et al. found that "enhancing carbon uptake and reducing emissions [from tropical deforestation] could account for as much as 50% of total carbon emissions."

communities, and provide a framework to potentially connect with programs and build confidence in financing efforts related to other GHG emissions mitigation programs. Board endorsement of the Proposed Project would not result in any regulatory amendments to the California Cap-and-Trade Regulation or in any tropical forest offset credits being eligible for use in the California Cap-and-Trade Program.

Importantly, the jurisdictional approach contemplated by the Proposed Project offers advantages in the international context that do not exist at the project level. For instance, a jurisdictional sector-based crediting program, as described previously, is designed to operate and define performance targets across the entire jurisdiction. (CARB 2015) Under a jurisdictional sector-based crediting approach, a "state or province develops policies and frameworks to reduce emissions…across the whole jurisdiction." (ROW 2013) In addition, this approach has "the potential to generate emissions reductions at [a] much larger scale and lower cost than the traditional project-based model." (ROW 2013) Moreover, the jurisdictional approach involves a robust public process, ensuring a wide range of stakeholders are involved from the very beginning in the design and implementation of the program which may not exist at the project-based level for some jurisdictions. (ROW 2013) Furthermore, because jurisdiction-wide programs are administered by the subnational government, there are mechanisms in place to provide for public accountability that may not exist at the project-based level for some jurisdictions. The jurisdictional sector-based crediting approach offers other advantages, such as guarding against risks of performance reversal and leakage at a broader scale. This is important because unlike in the United States, where data exists to better understand and account for leakage even at the project-level, the jurisdictional approach allows for a more complete picture across a jurisdiction where data may not exist to develop a general leakage factor that could apply at the project-scale. Leakage, if not accounted for appropriately may not lead to real reductions or sequestration from the perspective of the atmosphere. Jurisdictional approaches direct attention to large-scale changes, encouraging jurisdictions to create policy models that address the underlying causes of deforestation and land conversion, resulting in more protections against reversals in carbon stocks and against shifting of forest loss in one region to another in the jurisdiction, while ensuring permanent emission reductions. (CARB 2015)

By establishing the criteria that California and other jurisdictions may use in the future to assess tropical forest jurisdictions in the context of an emissions trading system, this standard is expected to increase rigor in subnational, national, and international programs to reduce emissions from tropical deforestation around the world that are interested in partnering with emissions mitigation programs or demonstrating real, quantifiable, and verifiable efforts to address deforestation. Establishing a California standard is also expected to incentivize retention of more forest land, compared to what otherwise may reasonably occur based on existing local economic conditions. Thus, establishing this standard would economically encourage a decrease in tropical deforestation and degradation, which would more effectively protect natural landscapes, reduce the many adverse impacts of tropical forest conversion, and address this important source of GHG emissions.

4. Ensure Rigorous Social and Environmental Safeguards

Robust consultation, public participation, participatory management, and sharing in the benefits of a jurisdiction sector-based crediting program are key elements of ensuring the success of such a program. The Proposed Project specifies minimum social and environmental safeguards requirements to ensure such participation, in particular from local and indigenous communities. The Proposed Project would require transparent documentation of this process, third-party verification of such documentation, a grievance mechanism process, and benefits sharing requirements. These social and environmental safeguards would build on international best practice principles, criteria, and indicators. Jurisdictions or programs that choose to use the California Tropical Forest Standard would only ever assess those implementing jurisdictions which can demonstrate a strong commitment to and successful implementation of rigorous social and environmental safeguards within their sector-based crediting programs.

5. Provide a Replicable, Robust Jurisdiction-Scale Model for Addressing Emissions from Tropical Deforestation

California has exhibited international climate leadership by developing approaches that can serve as models for other jurisdictions to consider incorporating or using for their own climate mitigation approaches. This includes California-developed programs such as California's Short-Lived Climate Pollutant Reduction Strategy (SLCP). The SLCP was developed to "serve as a model for action for other countries and jurisdictions to accelerate their progress to reduce emissions" from short lived climate pollutants. (CARB 2017a). For the reasons outlined in Objective 3, the jurisdictional approach to tropical forest programs contained in the Proposed Project is anticipated to serve as a robust, replicable model for other GHG emissions mitigation programs such as the International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and other emerging programs.

6. Meet Long-Term Climate Objectives

As noted in Objective 2 above, without significant reductions in emissions and increases in carbon sequestration from forests and land use, the world will not meet the goals of the Paris Agreement, and California will miss a critical opportunity to further long-term climate goals. By taking action to reduce emissions from deforestation, combined with their sequestration potential, forests may account for as much as 50 percent of the climate mitigation solution to stabilize atmospheric CO_2 on a global scale. (Goodman and Herold 2014; Houghton et al. 2015)

B. Proposed Recommended Actions and Reasonably Foreseeable Compliance Responses

The following section summarizes the recommended actions and the reasonably foreseeable compliance responses resulting from implementation of the Proposed

Project.[9] The anticipated compliance responses to the action discussed in this section focus on those activities with the potential to result in either a direct or indirect physical change in the environment.

1. Establish a Robust Standard for Assessing Programs that Reduce Emissions from Tropical Deforestation

a) Summary of Proposed Project

The Proposed Project would establish a California Tropical Forest Standard, which represents a first-of-its-kind attempt at proposing rigorous regulation-grade criteria for assessing jurisdiction-wide programs that reduce emissions from tropical deforestation. The standard builds on existing norms and requirements from the United Nations and other international bodies such as the World Bank's Forest Carbon Partnership Facility and Carbon Fund, previous staff work evaluating expert recommendations, voluntary carbon market tools and efforts, and GCF Task Force member programs. As such, use of this standard would be compatible with efforts tropical forest jurisdictions have taken pursuant to those other norms and requirements. Full details are included in the revised standard ~~and in the Notice~~ for this Proposed Project.

Importantly, the Proposed Project would not result in any linkage with any jurisdiction, nor would it allow any tropical forest offsets into the Cap-and-Trade Program without a future regulatory amendment process to consider incorporating the standard into the Cap-and-Trade Regulation and conduct linkage findings pursuant to SB 1018.

b) Reasonably Foreseeable Compliance Responses

Key drivers of tropical deforestation and forest degradation include commercial logging and clearing of forest for expanded cattle ranching and commercial agriculture. Criteria were developed to assess sector-based crediting programs designed to reverse and halt emissions from tropical deforestation and degradation. Incorporating these rigorous criteria into an emissions trading system or other GHG mitigation program may incentivize activities that reduce emissions from deforestation and degradation. Implementation of the Proposed Project by any jurisdiction would be intended to result in forest protection, forest management, forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture and agroforestry activities associated with the restoration of currently degraded areas, and would increase the value of forests and reduce pressure for deforestation of new areas.

A California-endorsed standard would be reflective of the years of work conducted to date, including efforts to establish robust monitoring, reporting, and verification requirements, establishing transparent baselines for carbon stocks and emissions, as well as mechanisms for quantifying emissions reductions, social and environmental safeguards, leakage prevention assessments, and benefit sharing requirements. Although no linkage is being proposed with California as part of this Proposed Project, it

[9] While we use the term "compliance responses" here, we note that use of the Proposed Project by other jurisdictions is entirely voluntary, and therefore electing to participate in the standard is voluntary.

is reasonably foreseeable that tropical states and provinces may undertake activities to meet a California Tropical Forest Standard if any jurisdiction with an emissions trading system chose to utilize such a standard. If a future linkage with an emissions trading system were approved, a linked jurisdiction could sell sector-based offset credits to entities in the emissions trading system. Monies would then be distributed, pursuant to the design of the implementing jurisdiction's program, to communities undertaking the compliance responses that generate the reductions in GHG emissions. Some examples of the types of activities that could meet these standards that are greater than business as usual (i.e., that demonstrate additional emissions reductions) are described below. Any jurisdiction choosing to utilize the California Tropical Forest Standard would need to approve acceptance of sector-based offset credits from each approved sector-based crediting program on an individual program basis.

Incorporation of the proposed standard is expected to serve as a model for other programs seeking to work with tropical jurisdictions, such as China's emerging emissions trading system and the International Civil Aviation Organization's offsetting system. Moreover, this standard is also expected to incentivize commodity companies to better assess their zero-deforestation sourcing and procurement commitments. Commodity companies would seek to source raw materials and other products from jurisdictions that can meet the California standard, as those jurisdictions will be demonstrating much reduced deforestation rates.

i) Land Use Planning

Low-emission rural development is an approach to land use planning in which climate stability is an explicit goal. It focuses on rural populations and integrates concerns for both socioeconomic development and the environment. It would contribute to lowering GHG emissions associated with land use (especially deforestation), while empowering local actors and institutions to maintain healthy ecosystems, respond to climate change, ensure human well-being, promote equitable social systems, and achieve sustainable economic development. It is distinguished by its focus on multi-sector participatory approaches that incorporate robust research into decision-making processes, industry engagement, and empowerment of local institutions and society.

ii) Agriculture and Ranching

Deforestation in tropical regions often links closely with agriculture and expanded cattle ranching.[10] (Yale 2018; Nepstad et al. 2014) Reduced deforestation is not incompatible with agriculture, however. Increasing sustainable cattle and agricultural production generally allows for productivity of pasturelands to increase relative to output if the land were managed conventionally. (Nepstad et al. 2014) Note that the goal here is not to create factory farms, but to maintain existing cattle husbandry in a way that allows ranchers and farmers to meet production goals while seeking to diminish the demand for larger land area to support agriculture. This could be accomplished through improved breeding, feeding, and other management practices. In addition, former cattle pastures could be converted to ponds to create native fish farms. These types of

[10] For example, cattle ranching "is the largest driver of deforestation in every Amazon country, accounting for 80% of current deforestation rates." (Yale 2018)

practices would reduce unsustainable farming methods that rely on clearing of forest where loss of soil fertility and weed problems occur.

iii) Silviculture and Agroforestry

Various opportunities exist to reduce deforestation from logging. Programs that could be used to create sector-based offset credits include timber certification through the Forest Stewardship Council, which establishes environmental, social, and regulatory compliance obligations; and, provision of incentives to forest dependent communities to restore degraded lands using traditional land use practices to protect habitats and watersheds and preserve their cultures.

iv) Other Extractive Drivers of Deforestation

Various opportunities also exist to reduce deforestation from extractive activities such as mining and oil and gas extraction. Programs that disincentivize deforestation across the boundaries of a jurisdiction would result in less extractive activity. Currently, some jurisdictions provide permits and concessions to companies to extract minerals, crude oil, gas, and other natural resources. The impacts of these extractive activities are often substantial, and often detrimental to local communities, local and regional ecosystems, and biodiversity. Extraction of valuable natural resources requires heavy-duty off-road equipment (e.g., dozers, excavators, drills), which can generate harmful levels of air pollutants, GHGs, vibration, and noise. Additionally, accidental release of toxic substances (e.g., fossil-fuels, lubricants) into the environment can cause adverse impacts to biological resources, hydrology and water quality, and aesthetics. Jurisdictions seeking to meet the California standard would be required to undertake changes in these practices to further reduce deforestation. This could take the form of reduced impact extractive activities or even cessation of concessions or permits.

v) Summary of Compliance Responses

Incorporating a robust standard for assessing potential future inclusion of individual sector-based crediting programs (e.g., through linkage) would incentivize program responses that limit physical changes to the environment. This could result in changes to existing agricultural activities, such as improved efficiencies on cattle ranches. Overall, incorporating the proposed standard would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. Thus, the proposed standard would economically encourage a decrease in deforestation and forest degradation, which would more effectively protect natural landscapes in the region. In addition, incorporation of the proposed standard is expected to serve as a model for other programs seeking to work with tropical jurisdictions, such as China's emerging emissions trading system and the International Civil Aviation Organization's offsetting system. Moreover, this standard is also expected to incentivize commodity companies to better assess their zero-deforestation sourcing and procurement commitments. Commodity companies would seek to source raw materials and other products from jurisdictions that can meet the California standard, as those jurisdictions will be demonstrating much reduced deforestation rates.

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3.0 ENVIRONMENTAL AND REGULATORY SETTING

The California Environmental Quality Act (CEQA) Guidelines (14 California Code of Regulations [CCR] Section 15000 et. seq.) require an environmental impact report (EIR) to include an environmental setting section that discusses the current environmental conditions near the project. This environmental setting normally constitutes the baseline physical conditions against which an impact is compared to determine whether it is significant (14 CCR 15125). In this case, the environmental setting is the conditions as they exist at the time this ~~Draft~~Final EA is prepared (i.e., 2018). As discussed above in Chapter 1 of this ~~Draft~~Final Environmental Analysis (~~Draft~~Final EA), the California Air Resources Board (CARB or Board) has a certified regulatory program and prepares an environmental analysis (EA) in lieu of an EIR. This ~~Draft~~Final EA is a functional equivalent to an EIR under CEQA. Therefore, to comply with the policy objectives of CEQA, an environmental setting, as well as a regulatory setting with relevant environmental laws and regulations, has been included as Attachment A to this document.

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4.0 IMPACT ANALYSIS AND MITIGATION MEASURES

This chapter contains an analysis of environmental impacts and mitigation measures that could result from the Proposed Project. Section A provides an overview of the basis for conducting environmental impact analysis and determining the potential significance of impacts that could occur as a result of implementation of this standard. Section B provides a programmatic environmental analysis of an illustrative, reasonably foreseeable compliance scenario that could result from implementation of the Proposed Project.

A. Basis for Environmental Impact Analysis and Significance Determinations

For determining whether the Proposed Project would have a potential effect on the environment, CARB evaluated the potential physical changes to the environment resulting from reasonably foreseeable compliance scenarios for the Proposed Project. CEQA requires the baseline for determining the significance of environmental impacts to normally be the existing conditions at the time the environmental review is initiated. (Cal. Code Regs., tit.14, § 15125(a).) Therefore, significance determinations reflected in this ~~Draft~~Final EA are based on a comparison of the potential environmental consequences of implementation of the Proposed Project with the regulatory setting and physical conditions in 2018 (see chapter 3 above, and Attachment A).

1. Adverse Environmental Impacts and Mitigation Measures

The analysis of adverse impacts on the environment, and significance determinations for those impacts, reflect the programmatic nature of the analysis of the reasonably foreseeable compliance responses to implementation of the Proposed Projects. These reasonably foreseeable compliance responses are described in more detail in Chapter 2, which include broadly-defined types of actions that may be taken by others in the future as a result of implementation of the Proposed Project. The relationship between reasonably foreseeable physical actions carried out in response to implementation of the Proposed Project, as well as environmentally sensitive resources or conditions that may be affected, are also taken into consideration. CARB has not yet decided to link with any sector-based offset programs. Because the purposes of this standard are primarily to provide a standard for use by other jurisdictions, and because the geographic reach of the Proposed Project is beyond the United States, CARB determined it would be more informative, and less potentially confusing, to analyze the Proposed Project in its own EA. As noted above, it remains unclear whether this proposal required an EA in the first place, but CARB has conservatively prepared this EA.

The impacts identified in this ~~Draft~~Final EA may be avoidable or reducible to a less-than-significant level by local planning and permitting authorities during project-level review processes. This ~~Draft~~Final EA takes a conservative approach in its post-mitigation significance conclusions, to avoid any risk of understating the impact, considering the current uncertainty as to how the Proposed Project will be implemented

and whether feasible mitigation would be sufficient or would be implemented by other parties. This approach fulfills CARB's disclosure responsibility under CEQA by noting that potentially significant environmental impacts may be unavoidable.

Where applicable, consistent with CARB's certified regulatory program requirements (Cal. Code Regs., tit.17, § 60005 (b)), this ~~Draft~~Final EA also acknowledges potential beneficial impacts on the environment in each resource area that may result from implementation of the Proposed Project. Any beneficial impacts associated with the Proposed Project are included in the impact assessment for each resource area described in this chapter.

B. Resource Area Impact Analysis and Mitigation Measures

The following discussion provides a programmatic analysis of the reasonably foreseeable compliance responses that could result from implementation of the Proposed Project, which are described in Chapter 2 of this ~~Draft~~Final EA. The impact analysis is organized by environmental resource areas in accordance with the topics presented in the Environmental Checklist in Appendix G to the CEQA Guidelines (14 CCR Section 15000 et. seq.). The reasonably foreseeable compliance responses associated with the Proposed Project are analyzed in a programmatic manner for several reasons: (1) any individual action or activity would be carried out under the same authorizing regulatory authority; (2) the reasonably foreseeable compliance responses would result in generally similar environmental effects that can be mitigated in similar ways (14 CCR Section 15168 (a)(4)); and (3) while the types of foreseeable compliance responses can be reasonably predicted, the specific location, design, and setting of the potential actions cannot feasibly be known at this time. If a later activity would have environmental effects that are not examined within this ~~Draft~~Final EA, the public agency with authority over the later activity would be required to conduct additional environmental review as required by CEQA or other applicable statute.

The impact analysis is based on reasonably foreseeable compliance responses. This approach provides a credible basis for the ~~Draft~~Final EA conclusions consistent with available evidence. Because the specific location, extent, and design of potential new sector-based crediting programs seeking to meet the standard in the Proposed Project cannot be known at this time, the impact discussions reflect a conservative assessment to describe the type and magnitude of effects that may occur (i.e., in that the conclusions tend to overstate potential adverse effects).

C. Impacts Associated with the Proposed Project

This section summarizes the potential impacts that could result from implementation of the reasonably foreseeable compliance responses due to the Proposed Project. This ~~Draft~~Final EA discusses impacts associated with the endorsement of a non-regulatory California Tropical Forest Standard that may one day be proposed for incorporation into an emissions mitigation program (including, potentially, the Cap-and-Trade Regulation) through another future regulatory amendment process. Environmental changes associated with the Proposed Project are considered under each resource area below.

1. Short-Term Construction-Related and Long-Term Operational-Related Effects to Aesthetics

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas. This could result in some changes to existing land uses related to activities such as improved efficiencies on cattle ranches and other types of agricultural lands.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest degradation. Therefore, the Proposed Project could also result in retention of forested areas. Where forest is retained as a result of the Proposed Project, the environmental baseline would be maintained because these forested areas would look similar to their current appearance.

Therefore, there would be **no adverse impact** to aesthetics associated with establishing a standard for assessing programs that reduce emissions from tropical deforestation.

2. Short-Term Construction-Related and Long-Term Operational-Related Effects to Agricultural and Forest Resources

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas. This could result in some changes to existing land uses related to activities such as improved efficiencies on cattle ranches and other types of agricultural lands. While pressure to clear forests for agricultural production and cattle ranching may persist independently of the Proposed Project, the Proposed Project

would incentivize those actions that have been demonstrated to increase productivity on existing nonforested land, and increasing the financial incentives to preserve existing forest lands in order to connect with emissions trading systems.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest degradation, which would more effectively protect natural landscapes in the region and reduce the adverse agricultural and forest resources effects of forest conversion.

These changes could ultimately increase the viability and health of forest resources while also encouraging sustainable agricultural activity. As such, the availability of sustainable agricultural and forest resources would likely improve. Agriculture and forest resources impacts related to the Proposed Project would be **less than significant**.

3. Short-Term Construction-Related and Long-Term Operational-Related Effects to Air Quality

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Offset-generating activities in external jurisdictions promulgating the Proposed Project for assessing programs that reduce emissions from tropical deforestation would not alter the level of forestry activities, thus the level of vehicle and equipment usage would not increase (CARB 2010). Similarly, establishing a standard would incentivize retention of more forest land compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. Thus, establishing a rigorous standard for assessing programs that reduce emissions from tropical deforestation would economically encourage a decrease in deforestation and forest degradation. As a result, forests may remain in place instead of being clear cut or otherwise removed, maintaining the current environmental conditions for air quality emissions and avoiding development-related emissions. Therefore, effects associated with establishing the Proposed Project would be **beneficial**.

4. Short-Term Construction-Related and Long-Term Operational-Related Effects to Biological Resources

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in forest destruction, which would more effectively protect natural landscapes and forest habitats in the region and reduce the adverse biological effects of forest conversion. Preservation of forest resources could, when compared to baseline conditions, maintain habitat for forest-based sensitive plant and animal species and maintain wildlife connectivity. Therefore, there would be **no adverse impact** to biological resources associated with establishing a standard for assessing programs that reduce emissions from tropical deforestation.

5. Short-Term Construction-Related and Long-Term Operational-Related Effects to Cultural Resources

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas. Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically

advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in forest destruction, which would more effectively protect natural landscapes in the region and reduce the adverse cultural resources effects of forest conversion and ground-disturbing activities. It is foreseeable that preservation of existing forest resources, which could contain culturally and historically important resources, would protect resources from disturbance and destruction by precluding heavy equipment use and ground disturbing activities associated with deforestation. As such, implementation of the Proposed Project would maintain the environmental baseline. Therefore, there would be **no adverse impact**.

6. Short-Term Construction-Related and Long-Term Operational-Related Effects to Energy Demand

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest degradation, which would avoid the energy demand effects of forest conversion, including fuel and electricity demand form construction and operation of facilities and agricultural fields. Therefore, the baseline energy demand would not be expected to significantly change as a result of the Proposed Project, and there would be **no adverse impact**.

7. Short-Term Construction-Related and Long-Term Operational-Related Effects to Geology and Soils

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for

deforestation of new areas. This could result in some changes to existing land uses related to activities such as improved efficiencies on cattle ranches and other types of agricultural lands.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest degradation, which would effectively maintain natural landscapes (including geology and existing, natural soils) in the region in their current baseline condition. There would be **no adverse impact**.

8. Short-Term Construction-Related and Long-Term Operational-Related Effects to Greenhouse Gases

Offset-generating activities in external jurisdictions would be similar in nature to avoided conversion and improved forest management activities in the U.S. Forest Offset Protocol. As stated in the 2010 FED, the protocol would not alter the level of forest activities, thus the level of vehicle and equipment usage would not increase.

Similarly, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. Thus, establishing a standard would economically encourage a decrease in forest destruction, maintaining CO_2 sequestration from retention of forest land, which would be considered a beneficial effect. While minor GHG emissions would result from fuels combusted in vehicles and machinery conducting forest management activities, those emissions are expected to be overwhelmingly eclipsed by the GHG reductions achieved from those activities. Therefore, GHG emission impacts associated with the Proposed Project could be **beneficial**.

9. Short-Term Construction-Related and Long-Term Operational-Related Effects to Hazards and Hazardous Materials

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest degradation, which would prevent the activities associated with deforestation that require the use of hazards and hazardous materials. Therefore, the Proposed Project would maintain baseline conditions and would result in **no adverse impact**.

10. Short-Term Construction-Related and Long-Term Operational-Related Effects to Hydrology and Water Quality

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas. This could result in some changes to existing land uses related to activities such as improved efficiencies on cattle ranches and other types of agricultural lands.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest destruction, which would more effectively protect natural landscapes in the region and maintain current baseline conditions for hydrology and water quality. Therefore, the Proposed Project would have **no adverse impact**.

11. Short-Term Construction-Related and Long-Term Operational-Related Effects to Land Use and Planning

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The

reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas. This could result in some changes to existing land uses related to activities such as improved efficiencies on cattle ranches and other types of agricultural lands. Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest destruction, which would maintain existing land uses. Similar to the U.S. Forest Offset Protocol as discussed in the 2017 Scoping Plan EA (CARB 2017c), dedicating land to continuous forest cover could prevent planned non-forest land uses from occurring. Therefore, efforts to reduce emissions from tropical deforestation could conflict with local land use plans. Note that CEQA Appendix G asks whether the proposed project "would conflict with an applicable land use plan, policy, or regulation…*adopted for the purpose of avoiding or mitigating an environmental effect*." (Emphasis added.) Here, it is unlikely the Proposed Project would specifically conflict with a plan "adopted for the purpose of avoiding or mitigating an environmental effect," since the Proposed Project itself endeavors to avoid changes from existing natural forest conditions. While local jurisdictions may need to appropriately amend such plans as needed to preserve forests, it is not certain they would do so. Therefore, this would be a potentially significant impact.

The authority to determine jurisdiction-specific impacts and require jurisdiction-specific mitigation lies with land use and/or permitting agencies for individual jurisdictions, and the programmatic level of analysis associated with this EA does not attempt to address any jurisdiction-specific details of mitigation as no jurisdiction is specifically identified within the Proposed Project. Nevertheless, this EA includes the following mitigation measure, which the relevant jurisdictions should adopt and implement:

Mitigation Measure 11-1

Before implementing a sector-based crediting program pursuant to the California Tropical Forest Standard, the implementing jurisdiction shall review all applicable land use plans, regulations, and policies, and shall amend such plans, regulations, and policies as appropriate to ensure program implementation is consistent with all applicable requirements and goals of the standard.

While the mitigation measure described above should be implemented, CARB lacks jurisdiction to ensure it is implemented. Consequently, while impacts could potentially be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that land use impacts would be **potentially significant and unavoidable**.

12. Short-Term Construction-Related and Long-Term Operational-Related Effects to Mineral Resources

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest destruction, which would more effectively protect natural landscapes in the region. However, it is reasonably foreseeable that existing forested landscapes could contain known mineral resources of economic significance. While some types of mineral resource recovery are less disruptive to forestry uses than others, implementation of the Proposed Project could inhibit the availability of mineral resources by, for example, placing restrictions on parcels that would preclude mineral resource recovery. As such, implementation of the Proposed Project could adversely affect the availability of a known mineral resource. While from an environmental perspective, preventing mineral extraction would be considered a positive environmental outcome, CEQA Guidelines Appendix G suggests this would be considered an adverse environmental effect. Thus, long-term operational-related mineral resources effects associated with the Proposed Project could be potentially significant.

Mitigation could include measures that allow certain types of resource recovery in forested areas; however, such mitigation could directly conflict with deforestation prevention efforts and may be infeasible.

While it is extremely difficult for CARB to develop appropriate mitigation measures in this resource area, given the variety of potential program designs, geographic areas, and mineral resources that may be encountered, an example of such a mitigation measure could include:

Mitigation Measure 12-1

Before implementing a sector-based crediting program pursuant to the California Tropical Forest Standard, the implementing jurisdiction shall consider the jurisdiction's potential for mineral extraction, as well as the potential for that extraction to conflict with the requirements and goals of the California Tropical Forest Standard. The jurisdiction may authorize mineral extraction within the jurisdiction's boundaries under the California Tropical Forest Standard to the extent it would not interfere with the requirements and goals of the standard.

Given the complexities noted above, it remains uncertain whether implementing jurisdictions would adopt and implement such a provision, or whether it would be feasible. Consequently, long-term operational-related effects to mineral resources associated with the Proposed Project would be **potentially significant and unavoidable**.

13. Short-Term Construction-Related and Long-Term Operational-Related Effects to Noise

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest destruction, which would more effectively protect natural landscapes in the region and avoid the adverse noise effects of forest conversion. Therefore, the Proposed Project would maintain the baseline noise environment, including the sounds of tropical forest wildlife (e.g., primate chatter and bird calls). There would be **no adverse impact**.

14. Short-Term Construction-Related and Long-Term Operational-Related Effects to Population, Employment, and Housing

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest degradation, which would more effectively protect natural landscapes in the region. Implementation of the Proposed Project would result in efforts to reduce emissions from tropical deforestation and would incentivize forest protection. The Proposed Project would not require changes in population or housing, and it must be stated that the Standard would not result in relocation of any population or community. Therefore, the Proposed Project would maintain the current baseline as it relates to population, housing, and employment. There would be **a less than significant impact**.

15. Short-Term Construction-Related and Long-Term Operational-Related Effects to Public Services

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land compared to what otherwise may

reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. As the Proposed Project would maintain existing land uses in forested areas, it would also maintain the current demand for public services. As such, there would be **less than significant impact** to public services.

16. Short-Term Construction-Related and Long-Term Operation-Related Effects to Recreation

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest degradation, which would more effectively protect natural landscapes in the region. As such, the Proposed Project would maintain the baseline of forest recreation. There would be **no adverse impact**.

17. Short-Term Construction-Related and Long-Term Operational-Related Effects to Transportation and Traffic

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas.

Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing

a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest destruction, which would more effectively protect natural landscapes in the region and avoid the adverse traffic and transportation effects of forest conversion. Therefore, the Proposed Project would maintain the current traffic and transportation conditions. As a result, there would be a **less than significant impact**.

18. Long-Term Operational-Related Effects to Utilities and Service Systems

Implementation of the Proposed Project could result in planning efforts and implementation of actions within external jurisdictions that reduce deforestation. The reasonably foreseeable changes to land uses would effectively limit degradation of the existing environment and would be intended to result in: forest protection, forest management and forest production processing and marketing, and increased sustainable agriculture, ranching, silviculture, and agroforestry activities associated with the restoration of degraded areas, so as to value forests and reduce pressure for deforestation of new areas. Changes associated with efforts to reduce emissions from tropical deforestation would be consistent with the existing land uses within specific project sites because these changes would be to preserve those existing forestry-related uses. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, establishing a standard would economically encourage a decrease in deforestation and forest destruction, which would more effectively protect natural landscapes in the region and avoid the adverse utilities and service system effects of forest conversion. As a result, the Proposed Project would maintain the current utilities baseline. Therefore, there would be **no adverse impact** to utilities and service systems.

5.0 CUMULATIVE AND GROWTH-INDUCING IMPACTS

A. Approach to Cumulative Analysis

This section satisfies requirements of CEQA to discuss how the project being analyzed would contribute to cumulative impacts. CARB's certified regulatory program (17 California Code of Regulation [CCR] 60000-60008) does not provide specific direction on a cumulative impacts analysis, and while CARB, by its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the CEQA Guidelines, the Guidelines nevertheless contain useful information for preparation of a thorough and meaningful cumulative analysis. The CEQA Guidelines require a lead agency to discuss a cumulative impact if the project's incremental effect combined with the effects of other projects is "cumulatively considerable" (CEQA Guidelines 15130(a)). The discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone (CEQA Guidelines 15130). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but must briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

In considering cumulative impacts, an agency may choose from among two approaches: it can prepare a list of past, present, and probable future projects that will produce related or cumulative impacts, or it can rely on a summary of projections contained in an adopted planning document or an adopted or certified environmental document for the planning document (CEQA Guidelines 15130(b)). Further, the CEQA Guidelines state that the pertinent discussion of cumulative impacts contained in one or more previously certified environmental impact reports (EIRs) may be incorporated by reference pursuant to provisions for tiering and program EIRs, and that no future cumulative analysis is required when the lead agency determines the regional and area wide impacts have already been addressed in the prior certified EIR for that plan (CEQA Guidelines 15130).

The CEQA Guidelines state that a previously approved plan for the reduction of GHG emissions may be used in cumulative impacts analysis, and that the pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference (14 CCR Section15130(d)). Furthermore, no further cumulative impacts analysis is required when a project is consistent with a general, specific, master or comparable programmatic plan where the lead agency determines that the regional or area wide cumulative impacts of the proposed project have already been adequately addressed, as defined in section 15152(f), in a certified EIR for that plan. (14 CCR Section 15130(d)). CEQA further directs that a tiered EIR focus on significant environmental effects that were not already analyzed in the previous environmental analysis. (Public Resources Code [PRC] Sections 21068.5; 21093; see also 21094(c).)

For purposes of this analysis, CARB is relying on the summary of projections contained in the EA prepared for California's 2017 Climate Change Scoping Plan (2017 Scoping

Plan EA). The 2017 Scoping Plan EA, which referenced the potential development of a jurisdictional sector-based crediting approach to address emissions from tropical deforestation, provided a program level review of significant adverse impacts associated with the reasonably foreseeable compliance responses that appeared most likely to occur because of implementing the recommended measures. The impact discussion includes, where relevant, construction-related effects, operational effects of new or modified facilities, and influences of the recommended actions on GHG and air pollutant emissions. The 2017 Scoping Plan EA considered cumulative impacts of a full range of reasonably foreseeable compliance responses to all the recommendations along with the expected background growth in California in its impacts conclusions for each resource topic area. The 2017 Scoping Plan EA considered the cumulative effect of other "closely related" past, present, and future reasonably foreseeable activities undertaken to reduce GHGs in response to statewide programs and policies, as well other activities with "related impacts" (CEQA Guidelines 15355(b); 15130(a)(1)). CARB has determined that for a cumulative analysis of the Proposed Targets, it is appropriate to rely on the cumulative analysis contained in the 2017 Scoping Plan EA, which is the statewide plan designed to reduce GHGs. The analysis of the 2017 Scoping Plan EA is hereby incorporated by reference. The portions of the 2017 Scoping Plan EA relevant to this discussion are also summarized below.

The analysis of cumulative impacts includes the following:

- A summary of the cumulative impacts found for each resource area in the 2017 Scoping Plan EA (certified by the Board in December 2017).
- A discussion of the types of compliance responses associated with the Proposed Project, pertinent to each resource area
- A significance conclusion that determines if the Proposed Project could result in a significant cumulative effect or a considerable contribution to an existing significant cumulative impact.

This approach to cumulative impacts analysis is "guided by the standards of practicality and reasonableness" (14 CCR Section 15130(b)) and serves the purpose of providing "a context for considering whether the incremental effects of the project at issue are considerable" when judged "against the backdrop of the environmental effects of other projects." (*CBE v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 119).

1. Summary of the Scoping Plan Compliance Responses

The 2017 Scoping Plan EA provided a program-level review of significant adverse impacts associated with the reasonably foreseeable compliance responses that appeared most likely to occur because of implementing the recommended measures. The impact discussion includes, where relevant, construction-related effects, operational effects of new or modified facilities, and influences of the recommended measures on GHG and air pollutant emissions. CARB staff prepared the 2017 Scoping Plan EA, certified by the Board in December 2017, as a program environmental document for the entire statewide plan for achieving California's GHG reduction goals. The Scoping Plan recommended six measures to achieve the 2030 target: renewable

energy and energy efficiency, SB 350, increased stringency of Low Carbon Fuel Standard (LCFS) (18 percent carbon intensity [CI] reduction by 2030), Mobile Source Strategies and Sustainable Freight Strategy, Short-Lived Climate Pollutant Reduction Strategy (SLCP Strategy), increased stringency of SB 375 2035 targets for Sustainable Communities Strategies, and post-2020 Cap-and-Trade Programs with declining caps. The compliance responses associated with these sectors measures are described as follows.

a) Renewable Energy and Energy Efficiency

As discussed in the 2017 Scoping Plan EA, reasonably foreseeable compliance responses associated with implementation of proposed measures for renewable energy and energy efficiency would range from minor modifications to existing buildings and large-scale construction projects that would allow for increased use of renewable energy and storage of produced renewable energy. Additional renewable energy supplies would be produced from new wind, solar thermal, solar photovoltaic, geothermal, solid-fuel biomass, biogas, and small hydroelectric facilities. These may require new and upgraded transmission lines to move the electricity from the source of generation to substations near population centers. Individual energy projects augment electrical grids by capturing excess electrical energy during periods of low demand and storing it in other forms until needed on an electrical grid. This energy storage may be procured from buildings, such as solar panels, and from large-scale renewable energy facilities. Energy storage systems are expected to consist of lithium battery-based systems. These systems are likely to be in industrial areas and cover large areas of land (i.e., more than one acre). In addition, regionalization of the grid may result in increased construction and operation of renewable energy projects. Expansion of the energy grid would require upgraded and new transmission lines.

Doubling of energy efficiency at existing buildings would include modifications to buildings, such as replacement of heating, ventilation, and air conditions (HVAC) systems with heat pumps and installation of more efficient water heaters. Other upgrades, such as installation of more efficient insulation, window replacements, and whole house or whole-building retrofits could occur as well, with the overall goals of creating zero net energy buildings. These activities would occur over a long period, such that the existing production rate of equipment would be sufficient to meet demand. That is, no new manufacturing facilities or other earth-moving activities would be needed.

b) Carbon Intensity Levels under the Low Carbon Fuel Standard

The reasonably foreseeable compliance responses to a CI reduction of at least 18 percent in the LCFS regulation could include incentives for various projects, such as processing plants for agriculture-based ethanol, cellulosic ethanol, and biomethane. Such incentives could result in minor expansions to existing operations, such as collection of natural gas from landfills, dairies, and wastewater treatment plants, modifications to crude production facilities (e.g., onsite solar, wind, heat, and/or steam generation electricity), and installation of energy management systems at refineries. It

is also reasonably foreseeable that some existing fossil refiners my start to produce biofuels. This may require some minor modifications to existing sites to retrofit onsite technologies and equipment.

c) Mobile Source Strategy (Clean Technology and Fuels Scenario) and Sustainable Freight Strategy

The 2017 Scoping Plan contains recommended measures for on-road light-duty vehicles, on-road heavy-duty vehicles, off-road federal and international sources, and off-road equipment. Reasonably foreseeable compliance responses evaluated in the 2017 Scoping Plan EA associated with the strategy included increased infrastructure for natural gas and hydrogen refueling stations, increased demand for lithium battery manufacturing and associated increases in lithium mining and exports, increased recycling or refurbishment of lithium batteries, and increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. The replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines is anticipated to increase requiring older models to be sold outside of California, scrapped, or recycled. Compliance responses could also include construction or operation of new manufacturing facilities to support zero and near-zero emission technologies and increased manufacturing of low-nitrogen oxide (NO_X) engines.

d) Short-Lived Climate Pollutant Reduction Strategy

In March 2017, the Board approved the SLCP Strategy and a Final EA for the Strategy. The SLCP Strategy was developed pursuant to SB 605 (Statutes of 2014) and SB 1383 (Statutes of 2016). The SLCP Strategy identifies measures to reduce short-lived climate pollutant emissions to meet specific targets required by SB 1383, including a 50 percent reduction in anthropogenic black carbon emissions, and a 40 percent reduction in methane and hydrofluorocarbons (HFC) emissions from 2013 levels by 2030.

SLCPs include methane, black carbon, and HFCs. They are powerful GHGs that remain in the atmosphere for a much shorter period than longer-lived climate pollutants, such as carbon dioxide (CO_2) and nitrous oxide (N_2O). Despite their relatively shorter atmospheric lifespan, their relative potency in terms of how they heat the atmosphere (i.e., global warming potential [GWP]) can be tens, hundreds, or even thousands of times greater than that of CO_2. For the purposes of the 2017 Scoping Plan, only the measures focused on methane and HFC were included and discussed, because these are the gases included in the inventory supporting the 2030 target.

Implementation of methane reduction measures under the SLCP Strategy consist of actions at dairies, landfills, wastewater treatment plants, and oil and gas facilities. The reasonably foreseeable compliance responses related to these measures could include the following:

- Converting flush-water lagoon manure management systems to solid manure management systems. Solid manure management systems could include scrape systems, anaerobic digestions systems, or pasture-based systems.

Conversion to solid manure management systems would potentially involve construction activities related to installing scrape systems or using equipment such as manure vacuums, storage silos and tanks, manure drying pads, and related manure handling equipment and storage facilities. The installation of anaerobic digesters would result in the installation and operation of a variety of industrial-type equipment and infrastructure at dairies. Conversion of dairy operations to pasture-based management may require new irrigation facilities, fencing, and structures to support animal husbandry (e.g., to provide shelter). In addition, dairy operators may install anaerobic digestion systems to capture and utilize manure methane on site. Collected manure could also be transported to centralized digesters, transported via dedicated pipelines to a centralized cleanup and pipeline injection facility and potentially co-digested with other feedstocks (such as food waste) for increased fuel production.

- Developing up to 100 new or expanded organic material composting and/or digesting facilities throughout the State. It is anticipated that new facilities would be sited near or at existing waste disposal sites or landfills. The typical kinds of equipment that would be installed and operated at compost facilities include tractors, compost turners, and grinders. The installation of anaerobic digesters would result in the installation and operation of a variety of industrial-type equipment and infrastructure at composting facilities (which potentially may include electricity generator sets, biogas storage tanks and compression and cleaning equipment, above ground pipeline systems, transmission poles and wires, and vehicle fueling stations).

- Existing, and potentially new, wastewater treatment plants that operate anaerobic digesters may install additional equipment to collect, store, and co-digest regionally-sourced organic wastes (such as food, cooking grease byproducts, and agricultural produce waste), and install other equipment and infrastructure to use captured biogas for beneficial purposes. Captured biogas could potentially be used for on or off-site electricity generation, or cleaned and compressed for use as a natural gas pipeline supplement or as a vehicle fuel. The use of digester biogas for these purposes would potentially result in the installation and operation of a variety of equipment and infrastructure at wastewater treatment plants (which potentially may include electricity generator sets, biogas storage tanks and compression and cleaning equipment, above ground pipeline systems, transmission poles and wires, and vehicle fueling stations). The operational nature of existing wastewater treatment plants would potentially expand from the single function of treating wastewater, to include multiple functions such as generating electricity for on- or off-site consumption, distributing pipeline gas, vehicle fueling, and organic waste diversion, handling, and disposal. These infrastructure additions to existing plants could be accommodated within the existing footprint of the facilities or may require facility expansion.

- Implementing CARB's regulation for oil and gas facilities could result in construction modifications to existing facilities, such as the installation of

vapor recovery systems, the installation of low-bleed or zero-bleed pneumatic devices, and the replacement of leaking equipment. This could include construction activities related to the installation or replacement of pipelines, flanges, valves and similar features already associated with oil and gas facilities. These equipment construction and installation activities would typically occur within the footprint of existing oil and gas facilities. A Final EA was prepared for this regulation and the Board approved the regulation on March 23, 2017.

The SLCP Strategy also contains actions to reduce HFC emissions within the State. These strategies could require replacing high-GWP HFCs used as refrigerants, foam expansion agents, aerosol propellants, and to a lesser extent, as solvents and fire suppressants, with low-GWP compounds such as ammonia, CO2, hydrocarbons, lower-GWP HFCs, and hydrofluoro-olefins (HFOs). Replacement of high-GWP compounds with low-GWP compounds would result in increased demand for low-GWP compounds (e.g. increased demand for HFOs) and modification to existing facilities. The increased demand for low-GWP compounds would occur because of the global HFC phase-down, and the possible incremental increased demand from the SLCP Strategy alone would not lead to an increase of facilities to manufacture these compounds. In many cases, using drop-in blends and/or low- or lower-GWP HFCs would require minor modifications to existing facilities, such as changes in the types of lubricants and compressor calibrations for foam production and refrigeration units. However, if CO_2-, hydrocarbon-, or ammonia-based systems are used, a complete retrofit of equipment would likely be necessary. Local permitting agencies may apply additional oversight on the planning and operations of refrigeration equipment using flammable refrigerants such as hydrocarbons, and toxic refrigerants such as ammonia.

e) Increased Stringency of Senate Bill 375 2035 Targets for Sustainable Communities Strategies

In the 2017 Scoping Plan, SB 375 supported the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities. Reasonably foreseeable compliance responses evaluated in the 2017 Scoping Plan EA included planning and construction responses from new housing, commercial and industrial development, preservation of open space, and roadway and infrastructure improvements. New infrastructure associated with SB 375 and Sustainable community Strategies (SCSs) could include commuter rail lines, electric charging and hydrogen fueling infrastructure, and new manufacturing or modified facilities to accommodate the increased use of zero emission vehicles and plug-in hybrid electric vehicles.

f) Post-2020 Cap-and-Trade Program with Declining Caps

In the 2017 Scoping Plan, the Cap-and-Trade Regulation was updated to include declining caps for the post-2020 program. Anticipated compliance responses include construction activities, infrastructure and equipment installations, and significant operational changes to facilities. An EA was prepared for the post-2020 Cap-and-Trade program, titled Final Environmental Analysis prepared for the Proposed Amendments to

the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation, certified by the Board on July 27, 2017 (CARB 2017b). Refer to that document for a more thorough description of the measures, potential compliance responses, and potential impacts: https://www.arb.ca.gov/regact/2016/capandtrade16/capandtrade16.htm.

2. Summary of the 2017 Scoping Plan Environmental Impacts

The 2017 Scoping Plan EA evaluated the environmental impacts related to the reasonably foreseeable compliance responses described above. Table 5-1 provides a summary of the conclusions of these impacts.

Table 5-1
Summary of California's 2017 Climate Change Scoping Plan Environmental Analysis Impacts by Sector

Resource Areas and Impact Categories	Significance Determination
Aesthetics	
Construction-Related Impacts	PSU
Operational Impacts	PSU
Agriculture and Forest Resources	
Construction-Related Impacts	PSU
Operational Impacts	PSU
Air Quality	
Construction-Related Impacts	PSU
Operational Impacts	LTS
Construction-Related and Operational Odors Impacts	PSU
Biological Resources	
Construction-Related Impacts	PSU
Operational Impacts	PSU
Cultural Resources	
Construction-Related and Operational Impacts	PSU
Energy Conservation	
Construction-Related Impacts	LTS
Operational Impacts	B
Geology and Soils	
Construction-Related Impacts	PSU
Operational Impacts	PSU

Table 5-1
Summary of California's 2017 Climate Change Scoping Plan Environmental Analysis Impacts by Sector

Resource Areas and Impact Categories	Significance Determination
Greenhouse Gas	
Construction-Related and Operational Impacts	B
Hazards and Hazardous Materials	
Construction-Related Impacts	PSU
Operational Impacts	PSU
Hydrology and Water Quality	
Construction-Related Impacts	PSU
Operational Impacts	PSU
Land Use Planning	
Construction-Related Impacts	LTS
Operational Impacts	PSU
Mineral Resources	
Construction-Related Impacts	LTS
Operational Impacts	LTS
Noise	
Construction-Related Impacts	PSU
Operational Impacts	PSU
Population and Housing	
Construction-Related Impacts	LTS
Operational Impacts	LTS
Public Services	
Construction-Related Impacts	LTS
Operational Impacts	LTS
Recreation	
Construction-Related Impacts	LTS
Operational Impacts	PSU
Transportation/Traffic	
Construction-Related Impacts	PSU
Operational Impacts	PSU

Table 5-1
Summary of California's 2017 Climate Change Scoping Plan Environmental Analysis Impacts by Sector

Resource Areas and Impact Categories	Significance Determination
Utilities and Service Systems	
Operational Impacts	PSU

B. Significance Determinations and Mitigation

Implementation of the measures in the 2017 Scoping Plan was determined to potentially result in cumulatively considerable contributions to significant cumulative impacts in certain resource areas, as discussed below. While suggested mitigation is provided in Chapter 4 above for each potentially cumulatively considerable impact, the mitigation needs to be implemented by other agencies. Where impacts cannot be feasibly mitigated, the Final 2017 Scoping Plan EA recognizes the impact as cumulatively considerable. The Board will need to adopt Findings and a Statement of Overriding Considerations for any significant and unavoidable environmental effects of the Proposed Project as part of the approval process.

C. Cumulative Impacts by Resource Area

1. Aesthetics

The 2017 Scoping Plan EA found that implementation of the recommended actions within the various sectors could result in a significant cumulative impact to aesthetic resources from construction and operational activities associated with new or modified facilities or infrastructure. As discussed in the 2017 Scoping Plan EA, the exact location of these new facilities or the modification of existing facilities is uncertain. Construction and operation of these facilities (although likely to occur in areas zoned or used for manufacturing or industrial purposes), could conceivably introduce or increase the presence of artificial elements (e.g., heavy-duty equipment, removal of existing vegetation, buildings) in areas of scenic importance, such as visibility from State scenic highways. The visual impact of such development would depend on several variables, including the type and size of facilities, distance and angle of view, visual absorption and placement in the landscape. In addition, facility operation may introduce substantial sources of glare, exhaust plumes, and nighttime glare from lighting for safety and security purposes. Implementation of mitigation measures would not reduce these impacts to a less-than-significant level because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, implementation of the recommended actions in the Scoping Plan could result in a considerable contribution to a cumulative aesthetics-related impact. This indicates that cumulative impacts would be significant.

The Proposed Project would result in less than significant effects on aesthetics. However, when combined with the potentially significant cumulative impact from the

2017 Scoping Plan EA the Proposed Project has the potential to contribute to the significant cumulative impact.

Thus, the Proposed Project **could result in a cumulatively considerable contribution to the significant cumulative impact** on aesthetics.

2. Agricultural and Forest Resources

The 2017 Scoping Plan EA found that implementation of the recommended measures within the various sectors could result in a significant cumulative impact to agricultural and forest resources. As discussed in the 2017 Scoping Plan EA, the exact location of these new facilities or the modification of existing facilities is uncertain. Construction of new facilities could result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, Williamson Act conservation contracts, or forest land or timberland, resulting in the loss of these resources. Additionally, increased demand for feedstock for fuels could result in indirect land use changes where food-based agriculture could shift to other areas and increase pressure to convert rangeland, grassland, forests, and other uses to agriculture. Because CARB has no land use authority, mitigation is not within its purview to reduce potentially significant impacts to less-than-significant levels. Compliance with existing land use policies, ordinances, and regulations would serve to minimize this impact. Land use impacts would be further addressed for individual projects through the local development review process. Mitigation measures were identified that could reduce these impacts that would be applied through the development review process. However, because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and because of the programmatic nature of this EA, impacts were determined to be potentially significant and unavoidable. Thus, the 2017 Scoping Plan could result in a considerable contribution to a cumulative impact on agricultural and forest resources. This indicates that cumulative impacts would be significant.

The Proposed Project would result in less than significant effects on agriculture and forestry resources. However, when combined with the potentially significant cumulative impact from the 2017 Scoping Plan EA the Proposed Project has the potential to contribute to the significant cumulative impact.

Thus, the Proposed Project **could result in a cumulatively considerable contribution to the significant cumulative impact** on agriculture and forest resources.

3. Air Quality

Overall, while some criteria air pollutant emissions and TACs would be associated with operational phases of compliance responses to the 2017 Scoping Plan programs in the long term the combined measures would result in beneficial operational-phase impacts. Therefore, the 2017 Scoping Plan would not have a cumulatively considerable impact

on operational air quality. This indicates that cumulative operational impacts would not be significant.

The 2017 Scoping Plan EA found that construction activities for compliance responses would result in emissions of criteria air pollutants, TACs, and odors. Implementation of mitigation measures could potentially reduce construction-related air quality impacts; however, because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with the 2017 Scoping Plan EA does not attempt to address project-specific details of mitigation. There is inherent uncertainty in the degree of mitigation that may ultimately by implemented to reduce potentially significant impacts. Consequently, the 2017 Scoping Plan EA took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that construction-related air quality impacts resulting from the development of new facilities or modification of existing facilities could be potentially significant and unavoidable. Thus, the Proposed Scoping Plan EA found there would be considerable contribution to a cumulative construction-related air quality impact. This indicates a significant cumulative construction impact.

The Proposed Project would result in a beneficial impacts to air quality. Thus, impacts associated with the Proposed Project in combination with the 2017 Scoping Plan **would not result in a significant cumulative impact** on air quality.

4. Biological Resources

Implementation of reasonably foreseeable compliance responses associated with recommended measures in the 2017 Scoping Plan could require construction and operational activities associated with new or modified facilities or infrastructure. The exact location of these new facilities or the modification of existing facilities is uncertain. Construction could require disturbance of undeveloped area, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings, and paving of parking lots, delivery areas, and roadways. These activities would have the potential to adversely affect biological resources (e.g., species, habitat) that may reside or be present in those areas. Because there are biological species that occur, or even thrive, in developed settings, resources could also be adversely affected by construction and operations within disturbed areas at existing manufacturing facilities or at other sites in areas with zoning that would permit the development of manufacturing or industrial uses. In addition, new regulations could affect biological resources depending on the type of crop, location, and need to convert lands, habitat destruction could occur, resulting in the loss of biodiversity. The location of new crop lands may affect conservation plans or disrupt important migratory routes. Indirect effects could occur as well, such as increased pesticide and nutrient use, the runoff of which could be detrimental to individual species.

The biological resources that could be affected by construction and operation associated with implementation of new regulations and/or incentive measures under the 2017 Scoping Plan would depend on the specific location of any necessary construction

and its environmental setting. Harmful impacts could include modifications to existing habitat; including removal, degradation, and fragmentation of riparian systems, wetlands, or other sensitive natural wildlife habitat and plan communities; interference with wildlife movement or wildlife nursery sites; loss of special-status species; and/or conflicts with the provisions of adopted habitat conservation plans, natural community conservation plans, or other conservation plans or policies to protect natural resources. Implementation of mitigation measures would not reduce these impacts to a less-than-significant level. Thus, the 2017 Scoping Plan, could result in a considerable contribution to a cumulative impact on biological resources. This indicates a significant cumulative impact on biological resources.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result in no adverse impacts to biological resources. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on biological resources.

5. Cultural Resources

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require construction activities associated with new or modified facilities or infrastructure. The exact location of these new facilities or the modification of existing facilities is uncertain. Construction activities could require disturbance of undeveloped area, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings, and paving of parking lots, delivery areas, and roadways. Demolition of existing structures may also occur before the construction of new buildings and structures. The cultural resources that could potentially be affected by ground disturbance activities could include, but are not limited to, prehistoric and historical archaeological sites, paleontological resources, historic buildings, structures, or archaeological sites associated with agriculture and mining, and heritage landscapes. Properties important to Native American communities and other ethnic groups, including tangible properties possessing intangible traditional cultural values, also may exist. Historic buildings and structures may also be adversely affected by demolition-related activities. Such resources may occur individually, in groupings of modest size, or in districts. Because culturally sensitive resources can also be located in developed settings, historic, archeological, and paleontological resources, and places important to Native American communities, could also be adversely affected by construction of new facilities. Implementation of mitigation measures could reduce these impacts, however because the authority to determine specific project-level impacts and mitigation is outside the purview of CARB, any mitigation identified would not reduce these impacts to a less-than-significant level. Thus, the 2017 Scoping Plan could result in a considerable contribution to a cumulative impact on cultural resources. This indicates a significant cumulative impact on cultural resources.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result

in no adverse impacts to cultural resources. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on cultural resources.

6. Energy Conservation

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require construction and operational activities associated with new or modified facilities or infrastructure. Temporary increases in energy demand associated with new facilities would include fuels used during construction, and gas and electric operational demands. Typical earth-moving equipment that may be necessary for construction includes: graders, scrapers, backhoes, jackhammers, front-end loaders, generators, water trucks, and dump trucks. While energy would be required to complete construction for any new or modified facilities or infrastructure projects, it would be temporary and limited in magnitude and would not result in sustained increases in demand that would adversely affect energy supplies. Therefore, the 2017 Scoping Plan **would not result in a cumulative short-term construction-related impact** on energy demand. This indicates that cumulative impacts would be less than significant.

The Proposed Project would result in no adverse impacts to energy conservation. Thus, impacts associated with the Proposed Project in combination with the 2017 Scoping Plan **would not result in a significant cumulative impact** on energy conservation.

7. Geology and Soils

Implementation of the reasonably foreseeable compliance responses associated with the recommended measures in the 2017 Scoping Plan could require construction and operational activities associated with new or modified facilities or infrastructure. The detrimental effects of agricultural practices on soil quality include erosion, desertification, salinization, compaction, and pollution. Loss of topsoil can increase erosion rates and affect water quality, which may be exacerbated through increased use of nutrients and pesticides.

The exact location of these new facilities or the modification of existing facilities is uncertain. Construction and operation could be located in a variety of relatively high-risk geologic and soil conditions that are considered to be potentially hazardous. For instance, the seismic conditions at the site of a new facility may have high to extremely high seismic-related fault rupture and ground shaking potential associated with earthquake activity. New facilities could also be subject to seismic-related ground failure, including liquefaction and landslides. Construction and operational activities could be located in a variety of geologic, soil, and slope conditions with varying amounts of vegetation that would be susceptible to soil erosion. Strong ground shaking could also trigger landslides in areas where the natural slope is naturally unstable or is over-steepened by the construction of access roads and structures. Construction and operation could also occur in locations that would expose facilities and structures to

expansive soil conditions. Development of new facilities could be susceptible to the presence of expansive soils particularly in areas of fine-grained sediment accumulation typically associated with playas, valley bottoms, and local low-lying areas.

The specific design details, siting locations, seismic hazards, and geologic, slope, and soil conditions for any particular facilities that could occur as a result of reasonably foreseeable compliance responses are not known at this time and would be analyzed on a site-specific basis at the project level. Therefore, for purposes of this analysis, development of these facilities could expose people and structures to relatively high levels of risk associated with strong seismic ground shaking, including liquefaction and landslides, and instability. These geologic, seismic, and soil-related conditions could result in damage to structures, related utility lines, and access roads, blocking access and posing safety hazards to people.

Because the authority to determine project-level impacts and require project-level mitigation lies with the land use approval and/or permitting agency for individual projects, and since the programmatic analysis does not allow project-specific details of mitigation, the degree of mitigation ultimately implemented to reduce the potentially significant impacts is uncertain. Thus, the 2017 Scoping Plan could result in a cumulatively considerable contribution to a cumulative impact on geology and soils. This indicates a significant cumulative impact.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result in no adverse impacts to geology and soils. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on geology and soils.

8. Greenhouse Gases

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require construction activities associated with new or modified facilities or infrastructure. Specific, project-related construction activities could result in increased generation of short-term GHG emissions in limited amounts associated with the use of heavy-duty off-road equipment, materials transport, and worker commutes. However, a majority of local agencies (e.g., air pollution control districts) do not recommend or require the quantification of short-term construction-generated GHGs for typical construction projects because these only occur for a finite period of time (e.g., during periods of construction) that is typically much shorter than the operational phase, and agencies generally recommended that GHG analyses focus on operational phase emissions, unless the project is of a unique nature requiring atypical (e.g., large scale, long-term) activity levels (e.g., construction of a new dam or levee) for which quantification and consideration (e.g., amortization of construction emissions over the lifetime of the project) may be recommended. Thus, short-term construction related GHG emissions impacts associated with reasonably foreseeable compliance responses for the recommended actions in the 2017 Scoping

Plan are considered less than significant when considered in comparison to the overall GHG reduction associated with implementation of the 2017 Scoping Plan.

The long-term operational impacts to GHG emissions from the recommended actions are primarily beneficial, consistent with the goals and objectives of the 2017 Scoping Plan to reduce emissions to achieve 2020 and post-2020 emission reduction goals.

Thus, the 2017 Scoping Plan **would not contribute to a cumulative impact** on GHG emissions. This indicates a less-than-significant cumulative impact.

The Proposed Project would result in a beneficial impacts to greenhouse gas emissions. Thus, impacts associated with the Proposed Project in combination with the 2017 Scoping Plan **would not result in a significant cumulative impact** on greenhouse gas emissions.

9. Hazards and Hazardous Materials

Reasonably foreseeable compliance responses to the recommended measures in the 2017 Scoping Plan could include construction and operation of new or modified facilities or infrastructure. The exact locations where construction and operations of new facilities or the modification of existing facilities would occur is uncertain. Construction activities may require the transport, use, and disposal of hazardous materials. Construction activities generally use heavy-duty equipment requiring periodic refueling and lubricating fluids. Large pieces of construction equipment (e.g., backhoes, graders) are typically fueled and maintained at the construction site as they are not designed for use on public roadways. Thus, such maintenance uses a service vehicle that mobilizes to the location of the construction equipment. It is during the transfer of fuel that the potential for an accidental release is most likely. Although precautions would be taken to ensure that any spilled fuel is properly contained and disposed, and such spills are typically minor and localized to the immediate area of the fueling (or maintenance), the potential remains for a significant release of hazardous materials into the environment. Consequently, construction activities could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

In addition, because potential facilities would likely occur within footprints of existing manufacturing facilities, the Proposed Scoping Plan would not be expected to result in locating new facilities near schools, public (or public use) airports, private airstrips, or wildlands; or on sites included on a list of hazardous materials sites or impair implementation of or physically interfere with an adopted emergency response or evacuation plan. In addition, as noted above, the handling of hazards materials would be required to comply with all applicable federal, State and local laws. As a result, operational impacts associated with the 2017 Scoping Plan on hazards and hazardous materials would be less-than-significant. However, since mine methane capture offset projects located within Canada are outside of the jurisdiction of the applicable federal, State and local laws, hazards and hazardous materials impacts related to implementation of these projects could be significant.

Mitigation measures are available that would reduce these impacts to a less-than-significant level; however, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts and the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, the 2017 Scoping Plan could result in a considerable contribution to a cumulative impact to hazards and hazardous materials. This indicates a significant cumulative impact.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result in no adverse impacts to hazards and hazardous materials. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on hazards and hazardous materials.

10. Hydrology and Water Quality

Construction activities and long-term operations associated with reasonably foreseeable compliance responses to the recommended measures in the 2017 Scoping Plan could be in a variety of conditions with regards to altering drainage patterns, flooding, and inundation by seiche, tsunami, or mudflow. The level of susceptibility varies by location. In addition, fuels regulation could alter agricultural practices, resulting in discharges to waterways of sediment, nutrients, pathogens, pesticides, metals, and salts. The specific design details, siting locations, and associated hydrology and water quality issues are not known at this time and would be analyzed on a site-specific basis at the project level. Therefore, for purposes of CEQA disclosure, these potential hydrology and water quality-related impacts could be significant. Implementation of mitigation measures to reduce these impacts would not reduce these impacts to a less-than-significant level because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, the 2017 Scoping Plan could result in a considerable contribution to a cumulative impact to hydrology and water quality. This indicates a significant cumulative impact.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result in no adverse impacts to hydrology and water quality. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on hydrology and water quality.

11. Land Use and Planning

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require both construction and long-term operation of new or modified facilities or infrastructure. The exact location of these new facilities or the modification of existing facilities is uncertain. However, facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of these facilities. Implementation

of the 2017 Scoping Plan would also include avoided deforestation through Forest Offset Protocols. Because avoided conversion projects could occur on land planned for other, non-forest uses and, if so, would prevent the planned non-forest use from occurring, avoided conversion projects could conflict with local land use plans. Thus, implementation of the recommended actions could divide an established community or conflict with a land use or conservation plan. Therefore, the 2017 Scoping Plan would result in a considerable contribution to a cumulative land use planning-related impact. This indicates a significant cumulative impact.

The Proposed Project's contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project may itself result in significant adverse impacts to land use and planning. Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and because of the programmatic nature of this EA, impacts were determined to be potentially significant and unavoidable. Thus, impacts associated with the Proposed Project **could result in a cumulatively considerable contribution to a significant cumulative impact** on land use and planning.

12. Mineral Resources

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require both the construction and operation of new or modified facilities or infrastructure. The exact location of these new or modified facilities and infrastructure is uncertain. New facilities and infrastructure would likely occur within existing footprints or in areas with consistent zoning, where original permitting and analyses considered mineral resources issues. Although construction of new facilities and infrastructure could occur in areas outside the footprints of existing facilities, short-term construction impacts would only temporarily affect the availability of known mineral resources of local regional, or state value. Thus, the 2017 Scoping Plan would not result in a considerable contribution to a cumulative short-term construction-related impact on mineral resources. Therefore, the 2017 Scoping Plan **would not result in a cumulative short-term construction-related impact** on mineral resources. This indicates that cumulative impacts would be less than significant.

The Proposed Project's contribution to the significant cumulative impact would be cumulatively considerable because it would, on its own, result in a significant impact to mineral availability. For the significant impact to mineral availability from the Proposed Project, mitigation could include measures that allow resource recovery in forested areas; however, such mitigation would directly conflict with deforestation prevention efforts and would be infeasible. Consequently, long-term operational-related effects to mineral resources associated with the Proposed Project would be **cumulatively considerable**.

13. Noise

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require construction and operation of new or modified facilities or infrastructure. These activities could result in the generation of short-term construction noise in excess of applicable standards or that result in a substantial increase in ambient levels at nearby sensitive receptors, and exposure to excessive vibration levels, which would be potentially significant. Operational noise impacts would not typically be expected due to the fact that typical compliance response activities would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of these facilities. However, operational noise related to new facilities, mining operations, and renewable energy projects could emit excessive levels of noise near sensitive receptors. Thus, operational effects of equipment constructed as a result of implementation of recommended actions associated with 2017 Scoping Plan could result in potentially significant impacts. Implementation of mitigation measures could reduce potential construction-related or operational noise impacts to a less-than-significant level; however, the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, the 2017 Scoping Plan could result in a considerable contribution to cumulative noise impacts. This indicates a significant cumulative impact.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result in no adverse impacts to noise. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on noise.

14. Population, Employment, and Housing

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require construction and operation of new or modified facilities or infrastructure. The exact location of these new facilities or the modification of existing facilities is uncertain. These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of such facilities. Construction of these facilities activities would require relatively small crews, and demand for these crews would be temporary (e.g., 6 to 12 months per project). Therefore, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Construction activities would not require new additional housing or generate changes in land use. Therefore, the 2017 Scoping Plan **would not result in a considerable contribution to a cumulative impact** to population and housing growth. This indicates that cumulative impacts to population and housing would be less than significant.

The Proposed Project would result in less than significant effects on population, employment and housing. However, when combined with the potentially significant

cumulative impact from the 2017 Scoping Plan EA the Proposed Project has the potential to contribute to the significant cumulative impact.

Thus, the Proposed Project **could result in cumulatively considerable contribution to the significant cumulative impact** on population, employment and housing.

15. Public Services

Reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could include construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities is uncertain. These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of these facilities. Construction activities would be anticipated to require relatively small crews, and demand for these crews would be temporary (e.g., 6-12 months per project). Therefore, it would be anticipated that the need for a substantial amount of construction worker migration would not occur and that a sufficient construction employment base would likely be available. Construction activities would not require new additional housing to accommodate or generate changes in land use and, therefore, would not affect the provision of public services. Therefore, the 2017 Scoping Plan **would not result in a considerable contribution to a cumulative impact** related to public services. This indicates that cumulative impacts to public services would be less than significant.

The Proposed Project would result in less than significant effects on public services. However, when combined with the potentially significant cumulative impact from the 2017 Scoping Plan EA the Proposed Project has the potential to contribute to the significant cumulative impact.

Thus, the Proposed Project **could result in cumulatively considerable contribution to the significant cumulative impact** on public services.

16. Recreation

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan Update could require construction and operations of new or modified facilities or infrastructure. The exact locations of potential new or modified facilities is uncertain. These activities would likely occur within footprints of existing facilities, or in areas with zoning that would permit their development. In addition, demand for construction of these crews would be temporary (e.g., 6-12 months per project). Therefore, the need for a substantial amount of construction worker migration would not occur and a sufficient construction employment base would likely be available. Thus, construction activities associated with reasonably foreseeable compliance responses would not be anticipated to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration would occur. In addition, the demand for new (or expansion of) recreational-related facilities would not occur as a result of construction

activities. New renewable energy projects could be located on recreational land or in close proximity to recreation resources. If these recreation activities were displaced by renewable energy projects, additional use pressure would be transferred to other similar recreation resource lands in the same region of the project. Therefore, the 2017 Scoping Plan Update would result in a cumulative contribution to a cumulative impact related to recreational facilities. This indicates there would be a significant cumulative impact.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result in no adverse impacts to recreation. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on recreation.

17. Transportation and Traffic

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require construction and operations of new or modified facilities or infrastructure. In addition, new fuels standards could result in changes to imports and statewide shipments of feedstock and distribution of fuels. Although detailed information about potential specific construction activities is not currently available, some of the potential compliance responses could result in short-term construction traffic (primarily motorized) from worker commute- and material delivery-related trips. The amount of construction activity would vary depending on the particular type, number, and duration of usage for the varying equipment, and the phase of construction. These variations would affect the amount of project-generated traffic for both worker commute trips and material deliveries. Depending on the amount of trip generation and the location of new facilities, implementation could conflict with applicable programs, plans, ordinances, or policies (e.g., performance standards, congestion management); and/or result in hazardous design features and emergency access issues from road closures, detours, and obstruction of emergency vehicle movement, especially due to project-generated heavy-duty truck trips. As a result, transportation and traffic impacts during construction projects associated with the 2017 Scoping Plan would be potentially significant.

Implementation of mitigation measures could reduce short-term construction related impacts to a less-than-significant level, but because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, the impacts are considered potentially significant and unavoidable. Thus, the 2017 Scoping Plan could result in a considerable contribution to a cumulative transportation and traffic-related impact. This indicates a significant cumulative impact.

Implementation of the reasonably foreseeable compliance responses under the 2017 Scoping Plan Update could also result in impacts associated with long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans. As part of the LCFS measures are anticipated to change the types of fuels consumed,

which could result in substantial effects on local routes' traffic patterns due to differences in where feedstocks are sourced, and how the finished fuels are transported. As a result, transportation patterns may change in relation to the location and operational shipping needs of new facilities. Depending on the number of trips generated and the location of fuel-related deliveries, implementation could conflict with applicable programs, plans, ordinances, or policies (e.g., performance standards, congestion management); and/or result in hazardous design features and emergency access issues from road closures, detours, and obstruction of emergency vehicle movement, especially due to project-generated heavy-duty truck trips. Additionally, under the LCFS measures, low-carbon and alternative diesel fuels entering the U.S. would be transported to appropriate facilities (e.g., blending facilities, distribution centers). While the LCFS regulations would not affect the quantities of fuels demanded, it could have a significant effect on traffic patterns on local routes.

of heavy equipment on rural roads, potentially creating unsafe conditions.

The Proposed Project would result in less than significant effects on transportation and traffic. However, when combined with the potentially significant cumulative impact from the 2017 Scoping Plan EA the Proposed Project has the potential to contribute to the significant cumulative impact.

Thus, the Proposed Project **could result in cumulatively considerable contribution to the significant cumulative impact** on transportation and traffic.

18. Utilities and Service Systems

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2017 Scoping Plan could require construction and operations of new or modified facilities or infrastructure. Newly constructed or modified facilities could generate substantial increases in the demand for water supply, wastewater treatment, storm water drainage, and solid waste services in their local areas. Any new or modified facilities, no matter their size and location would be required to seek local or State land use approvals prior to their development. Part of the land use entitlement process for facilities proposed in California requires that each of these projects undergo environmental review consistent with the requirements of CEQA and the CEQA Guidelines. It is assumed that facilities proposed in other states would be subject to comparable federal, state, and/or local environmental review requirements (e.g., CEQA) and that the environmental review process would assess whether adequate utilities and services (i.e., wastewater services, water supply services, solid waste facilities) would be available and whether the project would result in the need to expand or construct new facilities to serve the project.

The specific location and type of construction needs is not known and would be dependent upon a variety of market factors that are not within the control of CARB including: economic costs, product demands, environmental constraints, and other market constraints. Thus, the specific impacts from construction on utility and service systems cannot be identified with any certainty, and individual compliance responses

could potentially result in significant environmental impacts. Implementation of mitigation measures would not reduce these impacts to a less-than-significant level because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, the 2017 Scoping Plan could result in a considerable contribution to a cumulative impact with respect to utilities and service systems. This indicates a significant cumulative impact.

The Proposed Project's contribution to this significant impact would not be cumulatively considerable, given the conclusion in Chapter 4 that the Proposed Project would result in no adverse impacts to utilities and service systems. Thus, impacts associated with the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on utilities and service systems.

D. Growth-Inducing Impacts

As noted above, the proposed project would not directly result in any growth in population or housing. Thus, no substantial growth-inducing effects would occur as a result of implementation of the proposed project.

6.0 MANDATORY FINDINGS OF SIGNIFICANCE

Consistent with the requirements of the California Environmental Quality Act (CEQA) Guidelines section 15065 and section 18 of the Environmental Checklist, this Environmental Analysis (EA) addresses the mandatory findings of significance for the Proposed Project.

1) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat for a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

A finding of significance is required if a project "has the potential to substantially degrade the quality of the environment (14 CCR Section 15065(a))." In practice, this is the same standard as a significant effect on the environment, which is defined as "a substantial or potentially substantial adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (14 CCR Section 15382.)."

As with all of the environmental effects and issue areas, the precise nature and magnitude of impacts would depend on the types of projects authorized, their locations, their aerial extent, and a variety of site-specific factors that are not known at this time but that would be addressed by environmental reviews to be conducted by local or regional agencies with regulatory authority at the project-specific level. CARB would not be the agency responsible for conducting the project-specific environmental or approval reviews because it is not the agency with authority for making land use or project implementation decisions.

This ~~Draft~~Final EA, in its entirety, addresses and discloses potential environmental impacts associated with the proposed project, including any direct, indirect, and cumulative impacts in the following resource areas:

Aesthetics
Agriculture and Forest Resources
Air Quality
Biological Resources
Cultural Resources
Energy Demand
Geology and Soils
Greenhouse Gases
Hazards and Hazardous Materials
Hydrology and Water Quality
Land Use and Planning
Mineral Resources
Noise
Population and Housing
Public Services
Recreation
Transportation/Traffic
Utilities and Service Systems

As described in Chapter 4, this ~~Draft~~Final EA discloses potential environmental impacts, the level of significance prior to mitigation, proposed mitigation measures, and the level of significance after the incorporation of mitigation measures.

2) Does the project have impacts that are individually limited, but cumulatively considerable?

CEQA Guidelines requires a lead agency shall find that a project may have a significant impact on the environment where there is substantial evidence that the project has potential environmental impacts that are individually limited, but cumulatively considerable. (Cal. Code Regs., tit. 14, § 15065.) Cumulatively considerable means "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (Cal. Code Regs., tit. 14, § 15065, subd. (a)(3).) Cumulative impacts are addressed for each of the environmental topics listed above and are provided in Chapter 5, "Cumulative and Growth-Inducing Impacts," in this ~~Draft~~Final EA.

3) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

CEQA requires a lead agency to find that a project may have a significant impact on the environment where there is substantial evidence that the project has the potential to cause substantial adverse impacts on human beings, either directly or indirectly (Cal. Code Regs., tit. 14, § 15065, subd. (a)(4)). Under this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to impacts on certain individuals. While changes to the environment that could indirectly affect human beings would be represented by all the designated CEQA issue areas, those that could directly affect human beings include air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, population and housing, public services, transportation/traffic, and utilities, which are addressed in Chapter 4 of this ~~Draft~~Final EA. No significant impacts would result from the Proposed Project to those resource areas, although when viewed under a conservative lens, this EA concludes the project may result in cumulatively considerable impacts to air quality (among other resource areas). See Chapter 5.

7.0 ALTERNATIVES ANALYSIS

This section satisfies the California Environmental Quality Act (CEQA) requirements related to alternatives to the Proposed Project (14 California Code of Regulations [CCR] Section 15126.6). The following discussion provides an overview of the steps taken to develop alternatives to the Proposed Project (i.e., endorsement of the California Tropical Forest Standard), the project objectives associated with the proposed action, and an analysis of the alternatives' environmental effects and ability to meet the project objectives.

A. Approach to Alternatives Analysis

CARB's certified regulatory program (17 CCR Sections 60000-60008) requires that, when a contemplated action may have a significant effect on the environment, a document shall be prepared in a manner consistent with the environmental protection purposes of the CARB program and with the goals and policies of CEQA. Among other things, the document must address feasible alternatives to the proposed action that would substantially reduce any significant adverse impact identified.

The certified regulatory program provides general guidance that any action or proposal for which significant adverse environmental impacts have been identified during the review process shall not be approved or adopted as proposed if there are feasible mitigation measures or feasible alternatives available that would substantially reduce such adverse impacts. For purposes of this section, "feasible" means capable of being accomplished in a successful manner within a reasonable period, taking into account economic, environmental, social, and technological factors, and consistent with the Board's legislatively mandated responsibilities and duties (17 CCR Section 60006).

While CARB, by virtue of its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the CEQA Guidelines (14 CCR Section 15000 et. seq.), the Guidelines nevertheless provide useful information for preparation of a thorough and meaningful alternatives analysis. The CEQA Guidelines (14 CCR Section 15126.6) speak to evaluation of "a range of reasonable alternatives to the project, or the location of the project, which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects, and evaluate the comparative merits of the alternatives." The purpose of the alternatives analysis is to determine whether or not different approaches to or variations of the project would reduce or eliminate significant project impacts, within the basic framework of the objectives, a principle that is consistent with CARB's program requirements.

The range of alternatives is governed by the "rule of reason," which requires evaluation of only those alternatives "necessary to permit a reasoned choice" (14 CCR Section 15126.6 (f)). Further, an agency "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (14 CCR Section 15126.6 (f)(3)). The analysis should focus on alternatives that are feasible and that take economic, environmental, social, and technological factors into account. Alternatives that are remote or speculative need not be discussed. Furthermore, the

alternatives analyzed for a project should focus on reducing or avoiding significant environmental impacts associated with the project, as proposed.

B. Project Objectives

The objectives of the Proposed Project are to:

1. Facilitate Integrated and Cost-Effective Regional, National, and International Greenhouse Gas (GHG) Reduction Programs Pursuant to AB 32

2. Incentivize Reductions of GHG Emissions from a Major Source of Emissions Worldwide – Tropical Deforestation

3. Establish Robust Criteria for Emissions Trading Systems to Assess, and Potentially Include, Jurisdiction-Scale Programs that Reduce GHG Emissions from Tropical Deforestation

4. Ensure Rigorous Social and Environmental Safeguards

5. Provide a Jurisdiction-Scale Model for Addressing Emissions from Tropical Deforestation

6. Meet Long-Term Climate Objectives

These objectives are described in greater detail in Chapter 2, above.

C. Description of Alternatives

Detailed descriptions of each alternative are presented below. The analysis that follows the descriptions of the alternatives includes a discussion of the degree to which each alternative would meet the basic project objectives, and the extent to which each alternative would avoid potentially significant impacts identified in Chapter 4 of this ~~Draft~~Final Environmental Analysis (~~Draft~~Final EA).

1. Alternative 1: No-Project Alternative

a) Alternative 1 Description

CARB is including Alternative 1, the No-Project Alternative, to provide a good faith effort to disclose environmental information that is important for considering the Proposed Project. CARB's certified regulatory program does not mandate consideration of a "No-Project Alternative" (17 CCR Section 60006). Under CARB's certified program, the alternatives considered, among other things, must be "consistent with the state board's legislatively mandated responsibilities and duties." (17 CCR Section 60006). Although CARB need not consider the "No-Project Alternative" per its certified regulatory program, it should be noted that the CEQA Guidelines state "[t]he purpose of analyzing the no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (CEQA Guidelines section 15126.6(e)(1). As such, the discussion focuses on "what

would be reasonably expected to occur in the foreseeable future if the project were not approved . . .” (CEQA Guidelines section 15126.6(e)(2).

Under the No-Project Alternative, the Proposed Project would not be endorsed.

b) Alternative 1 Discussion

i) Objectives

The No-Project Alternative would fail to meet the project objectives listed in Chapter 2 and reiterated above. Most importantly, the No-Project Alternative would not provide for the endorsement of the California Tropical Forest Standard for assessing programs that reduce emissions from tropical deforestation (Objective 3). The No-Project Alternative would also fail to facilitate integrated GHG reduction programs (Objective 1), as well as fail to incentivize reductions from tropical deforestation (Objective 2) and fail to ensure rigorous social and environmental safeguards (Objective 4). Finally, the No-Project Alternative would fail to establish a jurisdiction-scale model for others to use (Objective 5) and would not support important actions needed to meet long-term climate goals (Objective 6). Therefore, the No-Project Alternative would not meet the basic project objectives.

ii) Environmental Impacts

Implementation of the No-Project Alternative would avoid the conservatively-designated significant and unavoidable impact to mineral resources availability and land use planning identified in Chapter 4 of this ~~Draft~~Final EA that is associated with incentivizing protection of international rainforests from deforestation. The No-Project Alternative would also result in increased deforestation when compared to the proposed project. Overall, establishing a standard for assessing programs that reduce emissions from tropical deforestation would incentivize retention of more forest land, compared to what otherwise may reasonably occur, as motivated by existing local economic conditions. For example, without incentives to preserve tropical forests, land use changes resulting in the loss of forest resources may be economically advantageous to local communities, which could motivate deforestation activities. Thus, endorsing a standard would economically encourage a decrease in deforestation and forest degradation, which would more effectively protect natural landscapes and reduce the adverse effects of forest conversion. The No Project Alternative would not result in efforts to reduce emissions from tropical deforestation and would not achieve the benefits of the Proposed Project. The potential environmental impacts of the No Project Alternative, compared to the Proposed Project, are discussed by resource area.

- **Aesthetics:** Preservation of forest resources in response to the Proposed Project would protect the existing visual character of a landscape which could be vulnerable to aesthetic degradation in cases where it is economically beneficial for local communities to engage in deforestation practices. The No Project Alternative would therefore result in adverse aesthetic impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Agriculture and Forestry Resources:** Preservation of forest resources in response to the Proposed Project would protect the existing forests that would otherwise be vulnerable to deforestation in cases where it is economically beneficial for local communities to engage in deforestation practices. The No Project Alternative would therefore result in adverse impacts to forestry when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Air Quality:** Implementation of the Proposed Project could cause a reduction in the frequency of clear cutting and slash and burn practices, which could result in a decrease in incidental emissions resulting from forest removal activities. Furthermore, trees and forests affect air quality through the direct removal of air pollutants, thus improving local ambient air quality (Nowak et al. 2018). Clear cutting often entails the cutting of all trees within a forested area using heavy-duty mechanical equipment which emit criteria air pollutants and TACs. Slash and burn practices includes the permanent conversion of tropical and subtropical forests through clear cutting followed by igniting the remaining forest residue. The resultant fires generate high levels of carbon monoxide, hydrocarbons, and PM that can contribute to the degradation of local and regional air quality conditions (Sandberg et al. 1975). The No Project Alternative would therefore result in adverse air quality impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Biological Resources:** Implementation of the Proposed Project could cause a reduction in the frequency of clear cutting and slash and burn practices, which could result in protection of habitats and biodiversity. Agricultural-related clear cutting and slash and burn deforestation practices are among the leading causes of species extinction globally (Sodhi et al. 2009). Preservation of forest resources could provide habitat for forest-based sensitive plant and animal species and maintain wildlife connectivity. The No Project Alternative would therefore result in adverse biological resources impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Cultural Resources:** Implementation of the Proposed Project could cause a reduction in the frequency of clear cutting and slash and burn practices, which could result in protection of culturally and historically important resources by reducing ground disturbance within forested areas. The No Project Alternative would therefore result in adverse cultural and historical resources impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Energy consumption:** Implementation of the Proposed Project could cause a reduction in the frequency of clear cutting and slash and burn practices, which could result in reduced use of heavy equipment and a correlated reduction in energy consumption. The No Project Alternative would therefore

result in additional energy use when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **GHG Emissions:** Implementation of the Proposed Project could cause a reduction in deforestation, which would more effectively maintain CO_2 sequestration from retention of forest land, which would be considered a beneficial effect on GHG emissions. The No Project Alternative would therefore result in additional GHG emission impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Geology/Soils:** Implementation of the Proposed Project could cause a reduction in deforestation, which would more effectively maintain natural landscapes in the region and reduce the adverse geology and soils effects of forest conversion, such as erosion that results from clearcutting. The No Project Alternative would therefore result in additional geology and soils impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Hazards and Hazardous Materials:** Implementation of the Proposed Project could reduce the frequency of slash and burn deforestation practices. Such activity entails the ignition of forest residues and can contribute to wildfire activity, which could expose humans or structures to hazardous fire conditions. A reduction in the prevalence of this deforestation method could produce an overall decrease in exposure to hazardous conditions associated with wildland fire. The No Project Alternative would therefore result in additional hazards and hazardous materials impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Hydrology and Water Quality:** Implementation of the Proposed Project could reduce the frequency of slash and burn deforestation practices. The removal of trees and subsequent root systems during deforestation compromises the land's ability to absorb and retain soil and water resulting in increase in the soil's susceptibility to erosion. Surface water quality can be degraded following precipitation events in areas vulnerable to erosion. Surface runoff removes sedimentation causing increased turbidity in nearby bodies of water. Additionally, surface water can relocate excess constituents (e.g., nitrogen and phosphorus) present in soils to surface water systems causing eutrophication and depletion of oxygen levels (Iowa State University 2009). Decreasing deforestation via the Proposed Project would avoid these effects. The No Project Alternative would therefore result in additional hydrology and water quality impacts when compared to the Proposed Project because it would not provide incentives to reduce deforestation.

- **Land Use:** Implementation of the Proposed Project would reduce the conversion of forestland into other uses, which would prevent land use

changes and avoid adverse impacts from land use changes. The No Project Alternative would therefore result in additional land use changes when compared to the Proposed Project because it would not provide an incentive to reduce deforestation.

- **Mineral Resources:** Implementation of the Proposed Project could preclude certain areas from being mined, thereby impeding the availability of mineral resources. The No Project Alternative would not result in placement of any restrictions on forested land, and deforestation to allow for mineral extraction may still occur. Therefore, the No Project Alternative would reduce this potentially significant and unavoidable impact of the Proposed Project.

- **Noise:** Implementation of the Proposed Project could result in decreased rates of clear cut and slash and burn deforestation practices. Consequently, noise generated from heavy-duty equipment used during deforestation activity (e.g., tree fellers, harvesters, backhoes) would not occur. As such, adverse ambient noise levels in areas containing sensitive receptors could be avoided. The No Project Alternative would therefore result in additional noise impacts when compared to the proposed project because it would not provide an incentive to reduce deforestation.

- **Population/Housing/Employment:** Activities associated with the Proposed Project could result in increased production of sustainable agriculture, ranching, and silviculture. This could result in additional employment benefits. Deforestation can also cause displacement of people as resources are depleted; the Proposed Project would reduce these effects by providing an incentive to avoid deforestation. The No Project Alternative would therefore result in additional population, housing, and employment when compared to the proposed project because it would not provide an incentive to reduce deforestation.

- **Public Services:** The Proposed Project could result in less deforestation. Key drivers of tropical deforestation and forest degradation include commercial logging and clearing of forest for expanded cattle ranching and commercial agriculture. These activities can result in increased strain on the on public services in communities affected by deforestation and forest degradation activities. Therefore, the Proposed Project would reduce some of the increased demand. Likewise, the No Project Alternative would therefore result in additional public services demand and impacts when compared to the proposed project because it would not provide an incentive to reduce deforestation.

- **Recreation:** Implementation of the Proposed Project would promote forest conservation and prevent deforestation, which could produce nascent recreational opportunities in ecotourism. Through the deployment of appropriate policy and initiatives, communities supportive of forest conservation could produce recreational opportunities consisting of high

quality natural beauty while keeping pollution low and limiting infrastructure development (Bhuiyan et al. 2011). The No Project Alternative would therefore result in additional adverse effects to recreation when compared to the Proposed Project because it would not provide an incentive to reduce deforestation.

- **Transportation/Traffic:** Implementation of the Proposed Project could result in decreased rates of clear cut and slash and burn deforestation practices. Such a decrease would also result in a reduction in worker commute and material hauling trips to deforestation sites, which would reduce on- and off-road vehicles miles traveled (VMT). The No Project Alternative would therefore result in additional adverse effects to traffic and transportation when compared to the Proposed Project because it would not provide an incentive to reduce deforestation.

- **Utilities/Service Systems:** Key drivers of tropical deforestation and forest degradation include commercial logging and clearing of forest for expanded cattle ranching and commercial agriculture. These activities would result in increased strain on the utilities and service systems in communities affected by tropical deforestation and forest degradation. Implementation of the Proposed Project could result in decreased rates of clear cut and slash and burn deforestation practices. This decrease would also result in a reduction in demand for utilities and service systems from workers associated with deforestation practices. The No Project Alternative would therefore result in additional adverse effects to utilities and service systems when compared to the Proposed Project because it would not provide an incentive to reduce deforestation.

Compared to the Proposed Project, the No Project Alternative would reduce California's ability to help address tropical deforestation, which is recognized as one of the most environmentally damaging contributors to long-term climate change.

2. Alternative 2: Endorse California Tropical Forest Standard That Includes Project-Based Criteria, Instead of Jurisdictional Sector-Based Crediting Program Criteria

a) Alternative 2 Description

Under Alternative 2, the Board would endorse a standard that establishes criteria for a project-based approach to addressing emissions from tropical deforestation rather than the Proposed Project, which establishes criteria for assessing a jurisdictional approach to addressing emissions from tropical deforestation. This approach would provide criteria for assessing individual projects, rather than an entire jurisdiction-scale program. Alternative 2 could still facilitate integrated GHG reduction programs (Objective 1), incentivize actions to reduce GHG emissions from tropical deforestation (Objective 2), provide criteria for rigorous social and environmental safeguards at the project-scale (Objective 4), and help meet long-term climate objectives (Objective 6).

b) Alternative 2 Discussion

i) Objectives

While some project objectives could be met by Alternative 2, it would fail to meet some basic project objectives listed in Chapter 2 and reiterated above. Most importantly, Alternative 2 would not provide for the endorsement of the standard for assessing programs that reduce emissions from tropical deforestation at the jurisdiction scale, and therefore, may not be as effective at reducing the potential for leakage or ensuring broader scale climate benefits (Objective 3). As discussed in Chapter 2, assessing programs using a jurisdiction-based approach is critical to avoiding the potential for leakage when there may not be sufficient data to establish a leakage emission factor at a broad level, such as at the national level. This alternative also would not establish a jurisdiction-scale model for other programs to use (Objective 5). Therefore, Alternative 2 would not meet the basic project objectives to the same level of the Proposed Project.

ii) Environmental Impacts

The environmental impacts of Alternative 2 would be similar to those of the Proposed Project, except they may reduce the impacts to land use and planning, because the scale of assessment would be reduced to the project-scale and could therefore consider consistency with land use plans at a more specific level. While this may on its face appear to be beneficial, it would also reduce the ability of the standard to achieve larger-scale reductions and benefits to agriculture and forestry resources and GHG emissions.

3. Alternative 3: Endorse California Tropical Forest Standard That Does Not Seek to Disincentivize Mineral Resource Extraction

a) Alternative 3 Description

Under Alternative 3, the Board would endorse a standard that establishes criteria for sector-based crediting programs to address emissions from tropical deforestation in the same fashion as the Proposed Project, except the standard would not specifically attempt to result in reduced mining and mineral extraction.

b) Alternative 3 Discussion

i) Objectives

Alternative 3 would provide criteria for assessing jurisdiction-scale programs (Objectives 3 and 5) and would still facilitate integrated GHG reduction programs (Objective 1), incentivize actions to reduce GHG emissions from tropical deforestation (Objective 2), provide most of the criteria for rigorous social and environmental safeguards (Objective 4), and help meet long-term climate objectives (Objective 6). However, Alternative 3 would fail to meet the Objective 4 as effectively as the Proposed Project. The Proposed Project specifically identifies a reduction in expansion of mineral extraction as one mechanism to demonstrate strong social and environmental safeguards. Alternative 3 would remove those criteria and would not ensure the same rigor vis-à-vis Objective 4 as the Proposed Project. Therefore, while Alternative 3 would meet this basic project objective, it would not do so to the same level as the Proposed Project.

ii) Environmental Impacts

The environmental impacts of Alternative 3 would be similar to those of the Proposed Project, except they may reduce impacts associated with limiting availability of mineral resources, as projects under such a program could be assessed to determine if mineral extraction would be hampered by the proposed action. While this may on its face appear to be beneficial, it would also reduce the ability of the standard to minimize leakage caused by deforestation activities associated with mineral extraction, and would thereby not provide the same benefits to forestry resources and GHG emissions as contemplated by the Proposed Project. In addition by allowing mineral extraction to continue it would result in potentially significant adverse impacts to many other resource areas as a result of mining, such as agriculture and forestry resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous waste, and hydrology and water quality to name a few.

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Attachment A

Environmental and Regulatory Setting

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1.0 Environmental Setting

The Proposed Project, as described in Chapter 2 of this ~~Draft~~Final EA, has multiple objectives that all aim at reducing GHG emissions from tropical deforestation at large scale. Endorsement of the California Tropical Forest Standard would not result in any amendments to the California Cap-and-Trade Program or in the approval of any sector-based offset credits being eligible for use in California; rather, it would represent a first-of-its-kind attempt at proposing rigorous regulation-grade criteria for assessing jurisdiction-wide programs that reduce emissions from tropical deforestation. The standard would specify criteria to assess jurisdictional sector-based offset crediting programs that reduce emissions from tropical deforestation that could be immediately used in jurisdictions across the globe that are taking action to reduce GHG emissions from tropical deforestation as well as potential future inclusion within a Cap-and-Trade Program. Much the same as other California international leadership initiatives, this jurisdictional approach to tropical forest programs is anticipated to serve as a robust, replicable model for other GHG emissions mitigation programs such as the International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and other emerging programs.

Since it is not possible to identify which jurisdictions may seek to use the standard within their existing or emerging emissions trading systems (or other emissions mitigation programs), nor which jurisdictions may seek to meet the standard, it is unduly speculative to include multiple jurisdictional legal and other requirements in this environmental and regulatory setting attachment. For the sake of disclosure under CEQA, this attachment includes the environmental and regulatory settings of the United States and California. At the end of Section 2 of this Attachment, CARB staff has included the international regulatory setting established by the United Nations Framework Convention on Climate Change (UNFCCC) for programs to reduce emissions from the deforestation and degradation of tropical forests, as established through decisions of the Conferences of the Parties to the UNFCCC.

If the California Tropical Forest Standard were to one day be proposed for incorporation into the California Cap-and-Trade Regulation, that potential future action would undergo its own regulatory amendment and environmental CEQA review process.

A. Aesthetics

1. United States

The United States, by virtue of its size, setting, and topographic and climatic variation, exhibits tremendous scenic diversity. The varied landscape ranges from coastal to desert and valley to mountain. Innumerable natural features and settings combine to produce scenic resources that are treasured by residents and visitors alike.

2. California

The visual character of California varies greatly related to topography and climate. The foothills form a transitional landform from the valley floor to the higher Sierra Nevada, Cascade, and Coast Ranges. The valley floor is cut by two rivers that flow west out of the Sierra Nevada and east out of the Coast Ranges. Irrigated agriculture land is the primary landscape in the Sacramento and San Joaquin Valleys, and the foothill landscape has been altered by grazing, mining, reservoir development, and residential and commercial development. The visual character of the state also varies dramatically from the north, which is dominated by forest lands, and the south, which is primarily residential and commercial development.

B. Agriculture and Forest Resources

1. United States

Forests in the United States are very diverse in composition and distribution, including oak-hickory and maple-beech-birch forests, as well as fir, pine, and redwood forests. It is estimated that, at the beginning of European settlement (circa 1630), the area of forest land in the current boundaries of the United States was approximately 423 million hectares, or about 46 percent of the total land area. By 1907, the area of forest land had declined to an estimated 307 million hectares or 34 percent of the total land area. Forest area has been relatively stable since 1907. In 1997, 302 million hectares or 33 percent of the total land area of the United States was in forest land. As of 2000, forest land area amount to approximately 70 percent of the area that was forested in 1630. Since 1630, approximately 120 million hectares of forest land have been converted to other uses, primarily agriculture (U.S. Forest Service [USFS] 2000).

U.S. land area amounts to nearly 2.3 billion acres, with nearly 1.2 billion acres in agricultural lands. The proportion of the land base in agricultural uses declined from 63 percent in 1949 to 51 percent in 2007, the latest year for which data are available. Gradual declines have occurred in cropland and pasture/range, while grazed forestland has decreased more rapidly. In 2007, 408 million acres of agricultural land were in cropland (-17 percent from 1949), 614 million acres were in pasture and range (-3 percent), 127 million acres were in grazed forestland (-52 percent), and 12 million acres were in farmsteads and farm roads (-19 percent) (U.S. Department of Agriculture [USDA] 2016).

The 2012 Census of Agriculture recorded 2,109,303 farms in the United States. The top five states, based on the value of agricultural products sold and on their percentage of the total value are: California (10.8 percent), Iowa (7.8 percent), Texas (6.4 percent), Nebraska (5.8 percent) and Minnesota (5.4 percent). Most states have laws in place to support agriculture and protect agricultural land. (USDA 2014).

2. California

The State of California maps and classifies farmland through the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP). Classifications

are based on a combination of physical and chemical characteristics of the soil and climate that determine the degree of suitability of the land for crop production. The classifications under the FMMP are as follows:

- Prime Farmland—land that has the best combination of features for the production of agricultural crops;
- Farmland of Statewide Importance—land other than Prime Farmland that has a good combination of physical and chemical features for the production of agricultural crops, but that has more limitations than Prime Farmland, such as greater slopes or less ability to store soil moisture;
- Unique Farmland—land of lesser quality soils used for the production of the state's leading agricultural cash crops;
- Farmland of Local Importance—land of importance to the local agricultural economy;
- Grazing Land—existing vegetation that is suitable for grazing;
- Urban and Built-Up Land—land occupied by structures in density of at least one dwelling unit per 1.5 acres;
- Land Committed to Nonagricultural Use—vacant areas; existing land that has a permanent commitment to development but has an existing land use of agricultural or grazing lands; and
- Other Land— land not included in any other mapping category, common examples of which include low-density rural developments, brush, timber, wetland, and vacant and nonagricultural land surrounded on all sides by urban development.

The California Environmental Quality Act (CEQA) Section 21095 and CEQA Guidelines Appendix G, together, define Prime, Unique, and Farmland of Statewide Importance as "Important Farmland," whose conversion may be considered significant. Local jurisdictions can further consider other classifications of farmland as important and can also utilize an agricultural land evaluation and site assessment model to determine farmland importance and impacts from conversion.

As of 2012, California contained approximately 5 million acres of Prime Farmland; approximately 2.6 million acres of Farmland of Statewide Important; approximately 1.3 million acres of Unique Farmland; approximately 3.2 million acres of Farmland of Local Importance; and approximately 19.2 million acres of grazing land (FMMP 2015).

California produces over a third of the vegetables and two thirds of the fruits and nuts in the United States. California's agricultural abundance includes more than 400 commodities and supplies 99 percent or more of the following to the United States: almonds, artichokes, dates, dried plums, figs, garlic, kiwifruit, olives and olive oil, pistachios, raisins, table grapes, and walnuts. In 2016, 76,700 farms operated in California, which represented a less than 1 percent reduction over 2015. Over 27 percent of California farms generated commodity sales over $100,000, greater than the national average of 20 percent. The amount of land devoted to farming and ranching in California decreased slightly to 25.4 million acres in 2016. The average farm size was

331 acres in 2016, up from the 2015 farm size, but still below the national average of 442 acres (California Department of Food and Agriculture [CDFA] 2018).

a) Williamson Act

The California Land Conservation Act of 1965--commonly referred to as the Williamson Act--enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses as opposed to full market value. The Open Space Subvention Act of 1971 provided local governments an annual subvention of forgone property tax revenues from the state through the year 2009; these payments have been suspended in more recent years due to revenue shortfalls.

Of California's 58 counties, 52 have executed contracts under the Land Conservation Act Program. The 15.4 million acres reported as enrolled in Land Conservation Act contracts statewide in 2013, represents approximately 50 percent of California's farmland total of about 30 million acres, or about 31 percent of the State's privately owned land (California Department of Conservation [DOC] 2016).

b) Forestry Resources

Forestland is defined as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits (Public Resources Code [PRC] 12220[g]). There are 40,233,000 acres of forested land within California including oak woodlands and conifer forests (CDFW 2014).

Timberland is privately-owned land, or land acquired for state forest purposes, which is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, of, at minimum 15 cubic feet per acre (Government Code Section 51104[f]). Forest managed for harvest is called timberland, and includes 2,932,000 acres in private ownership, 146,000 acres in State ownership, 10,130,000 acres in federal ownership, and 4,551,000 acres of non-industrial timberland in private ownership (CDFW 2017).

C. Air Quality

1. United States

At the federal level, the U.S. Environmental Protection Agency (U.S. EPA) has oversight of State programs. In addition, U.S. EPA established emission standards for mobile sources such as ships, trains, and airplanes. The U.S. EPA has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called criteria air pollutants. Periodically, the standards are reviewed and may be revised. The current standards are listed below in Table A1-1. Units of measure for the standards are parts per million by volume, parts per billion by volume, and micrograms per cubic meter of air.

2. California

The California Air Resources Board (CARB) is California's lead air agency and controls emissions from mobile sources, fuels, and consumer products, as well as air toxics. CARB also coordinates local and regional emission reduction measures and plans that meet the NAAQS and California Ambient Air Quality Standards. CARB is charged with developing the state's State Implementation Plan (SIP), which details the state's plan to achieve the NAAQS and is submitted to U.S. EPA for review. At the federal level, the U.S. EPA has oversight of State programs. In addition, U.S. EPA alone has jurisdiction to establish emission standards for certain mobile sources such as ships, trains, and airplanes.

a) Criteria Air Pollutants

Concentrations of emissions of criteria air pollutants (CAP) are used to indicate the quality of the ambient air because these are the most prevalent air pollutants known to be deleterious to human health. A brief description of each CAP is provided below. Emission source types and health effects are summarized in Table A1-1.

Table A1-1: Sources and Health Effects of Criteria Air Pollutants

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
Ozone	Secondary pollutant resulting from reaction of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO_X results from the combustion of fuels	Increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	Permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	Headache, dizziness, fatigue, nausea, vomiting, death	Permanent heart and brain damage
Nitrogen dioxide (NO_2)	Combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	Coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	Chronic bronchitis and decreased lung function
Sulfur dioxide (SO_2)	Coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO_2 exposure to

Table A1-1: Sources and Health Effects of Criteria Air Pollutants			
Pollutant	**Sources**	**Acute[1] Health Effects**	**Chronic[2] Health Effects**
			chronic health impacts
Respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$)	Fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of SO_2 and ROG	Breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	Alterations to the immune system, carcinogenesis
Lead	Metal processing	Reproductive/ developmental effects (fetuses and children)	Numerous effects including neurological, endocrine, and cardiovascular effects

[1] "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at relatively high concentrations.

[2] "Chronic" refers to effects of long-term exposures to criteria air pollutants, even at relatively low concentrations.

Sources: U.S. EPA 2017

b) Ozone

Ozone is a gas composed of three atoms of oxygen (O_3). Ozone occurs both in the Earth's upper atmosphere (stratospheric) and at ground level (tropospheric). Stratospheric ozone occurs naturally in the upper atmosphere, where it forms a protective layer that shields us from the sun's harmful ultraviolet rays. Tropospheric, or ground level ozone, is not emitted directly into the air, but is created by chemical reactions between NO_X and volatile organic compounds (VOCs). This happens when pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants, and other sources chemically react in the presence of sunlight. Ozone at ground level is a harmful air pollutant, because of its effects on people and the environment, and it is the main ingredient in "smog" (U.S. EPA 2018).

c) Nitrogen Dioxide

NO_2 is a brownish, highly-reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a

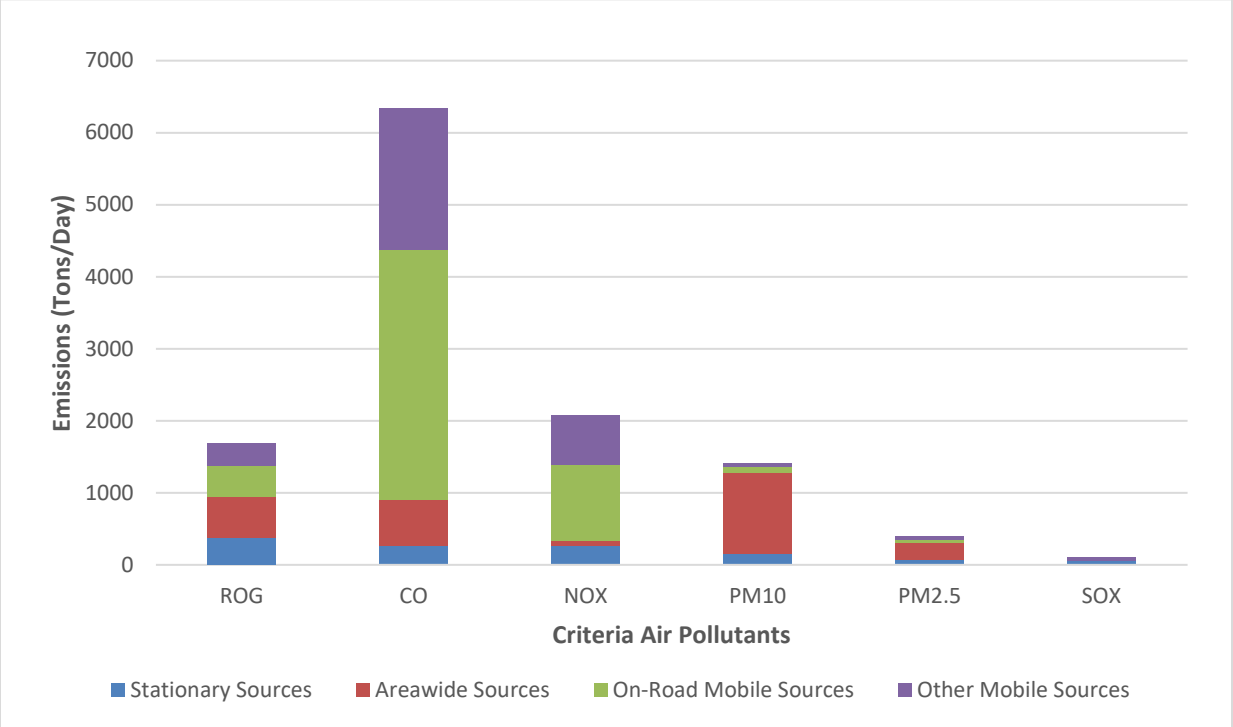
particular geographical area may not be representative of the local sources of NO_X emissions (U.S. EPA 2017).

d) Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction equipment, fires and natural windblown dust, and particulate matter formed in the atmosphere by reaction of gaseous precursors (CARB 2013a). $PM_{2.5}$ includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less. PM_{10} emissions in California are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Direct emissions of PM_{10} have increased slightly in California over the last 20 years, and are projected to continue to increase. $PM_{2.5}$ emissions have remained relatively steady over the last 20 years and are projected to increase slightly through 2020. Emissions of $PM_{2.5}$ are dominated by the same sources as emissions of PM_{10} (CARB 2013a).

e) Emission Inventory

Exhibit 1 summarizes emissions of CAPs within California for various source categories. According to California's emission inventory, mobile sources are the largest contributor to the estimated annual average for air pollutant levels of ROG and NO_X accounting for approximately 43 percent and 83 percent, respectively, of the total emissions. Area wide sources account for approximately 83 percent and 65 percent of California's PM_{10} and $PM_{2.5}$ emissions, respectively (CARB 2013b).



Source: CARB 2013b
Exhibit 1 California 2012 Emission Inventory

f) Toxic Air Contaminants

Concentrations of toxic air contaminants (TACs) are also used to indicate the quality of ambient air. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

Today, the emissions from combustion of fuel in motor vehicles and off-road equipment are the primary source of air toxics risk in California. Particulate matter (PM) from diesel-fueled engines is a TAC and diesel PM accounts for approximately 60 percent of the current estimated inhalation cancer risk for background ambient air. Some examples of sources that contribute to higher potential health impacts from mobile diesel PM include freight hubs, such as ports, rail yards and distribution centers. Because diesel PM cannot be directly measured in the ambient air, surrogate compounds and the emission inventory are used to estimate the ambient concentration. Both the combustion and evaporation of gasoline used in vehicles, lawn and garden equipment, recreational watercraft, and others produce other prevalent air toxics. Examples of stationary sources that also contribute to increased health risks to nearby residents include: metal finishing/manufacturing, chrome plating facilities, various product manufacturing (e.g., food, chemical, material, and etc.), stationary diesel engines (e.g., emergency backup generators), and refineries (CARB and CAPCOA 2015).

D. Biological Resources

1. United States

The U.S. is comprised of many different biological provinces, or biomes, including tundras, coniferous forests, deciduous forests, rain forests, grasslands, and deserts. Each biome provides a sanctuary to a diverse variety of biological species. Scientists have documented more than 200,000 species in the U.S., representing more than 10 percent of the species worldwide (The Nature Conservancy 2002).

2. California

The state's geography and topography have created distinct local climates ranging from high rainfall in northwestern mountains to the driest place in North America, Death Valley. North to south, the state extends for almost 800 miles, bridging the temperate rainforests in the Pacific Northwest and the subtropical arid deserts of Mexico. Many parts of the state experience Mediterranean weather patterns, with cool, wet winters and hot, dry summers. Summer rain is indicative of the eastern mountains and deserts, driven by the western margin of the North American monsoon. Along the northern coast abundant precipitation and ocean air produces foggy, moist conditions. High mountains have cooler conditions, with a deep winter snow pack in normal climate years. Desert conditions exist in the rain shadow of the mountain ranges (CDFW 2015).

While the state is largely considered to have a Mediterranean climate, it can be further subdivided into six major climate types: Desert, Marine, Cool Interior, Highland, Steppe, and Mediterranean. California deserts, such as the Mojave, are typified by a wide range of elevation with more rain and snow in the high ranges, and hot, dry conditions in valleys. Cool Interior and Highland climates can be found on the Modoc Plateau, Klamath, Cascade, and Sierra ranges. Variations in slope, elevation, and aspect of valleys and mountains result in a range of microclimates for habitats and wildlife. For example, the San Joaquin Valley, exhibiting a Mediterranean climate, receives sufficient springtime rain to support grassland habitats, while still remaining hot and relatively dry in summer. Steppe climates include arid, shrub-dominated habitats that can be found in the Owens Valley, east of the Sierra Nevada, and San Diego, located in coastal southern California (CDFW 2015).

The marine climate has profound influence over terrestrial climates, particularly near the coast. Additionally, the state is known for variability in precipitation because of the El Niño-Southern Oscillation (ENSO) and the Pacific Decadal Oscillation. Oscillations are the cyclical shifting of high and low pressure systems, as evidenced by the wave pattern of the jet stream in the northern hemisphere. The ENSO is the cycle of air pressure systems influenced by the location of warm and cold sea temperatures. El Niño events occur when waters are warmer in the eastern Pacific Ocean, typically resulting in greater precipitation in southern California and less precipitation in northern California, and La Niña events occur when waters are colder in the eastern Pacific resulting in drier than normal conditions in southern California and wetter conditions in northern California during late summer and winter. The warmer ocean temperatures associated with El Niño conditions also result in decreased upwelling in the Pacific Ocean (CDFW 2015).

California has the highest numbers of native and endemic plant species of any state, with approximately 6,500 species, subspecies, and varieties of plants, representing 32 percent of all vascular plants in the United States. Nearly one-third of the state's plant species are endemic, and California has been recognized as one of 34 global hotspots for plant diversity. Within the California Floristic Province, which encompasses the Mediterranean area of Oregon, California, and northwestern Baja, 2,124 of the 3,488 species are endemic, representing a 61 percent rate of endemism. Over 200 species, subspecies, and varieties of native plants are designated as rare, threatened, or endangered by state law, and over 2,000 more plant taxa are considered to be of conservation concern (CDFW 2015).

California has a large number of animal species, representing a substantial proportion of the wildlife species nationwide. The state's diverse natural communities provide a wide variety of habitat conditions for wildlife. The state's wildlife species include approximately 100 reptile species, 75 amphibian species, 650 bird species, and 220 mammal species. Additionally, 48 mammals, 64 birds, 72 amphibians and reptiles, and 20 freshwater fish live in California and nowhere else (CDFW 2015).

California exhibits a wide range of aquatic habitats from the Pacific Ocean to isolated hillside seeps, to desert oases that support both water-dependent species and provide

essential seasonal habitat for terrestrial species. Perennial and ephemeral rivers and streams, riparian areas, vernal pools, and coastal wetlands support a diverse array of flora and fauna, including 150 animal and 52 plant species that are designated special-status species. The California Natural Diversity Database identifies 123 different aquatic habitat-types in California, based on fauna. Of these, 78 are stream habitat-types located in seven major drainage systems: Klamath, Sacramento-San Joaquin, North/Central Coast, Lahontan, Death Valley, South Coast, and Colorado River systems. These drainage systems are geologically separated and contain distinctive fishes and invertebrates. California has approximately 70 native resident and anadromous fish species, and 72 percent of the native freshwater fishes in California are either listed, or possible candidates for listing as threatened or endangered, or are extinct (CDFW 2015).

E. Cultural Resources

1. United States and Canada

Cultural resources include archaeological sites of prehistoric or historic origin, built or architectural resources older than 50 years, traditional or ethnographic resources, and fossil deposits of paleontological importance. The United States and Canada have a cultural heritage that dates back to some 25,000-60,000 years ago, when the first known inhabitants of the land that would eventually become the United States crossed the Bering land bridge into Alaska.

All areas within the United States and Canada have the potential for yielding as yet undiscovered archaeological and paleontological resources and undocumented human remains not interred in cemeteries or marked formal burials. These resources have the potential to contribute to our knowledge of the fossil record or local, regional, or national prehistory or history.

Archaeological resources include both prehistoric and historic remains of human activity. Built environment resources include an array of historic buildings, structures, and objects serving as a physical connection to America's past. Traditional or ethnographic cultural resources may include Native American sacred sites and traditional resources of any ethnic community that are important for maintaining the cultural traditions of any group. "Historical resources" is a term with defined statutory meaning and includes any prehistoric or historic archaeological site, district, built environment resource, or traditional cultural resource recognized as historically or culturally significant (PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)). Paleontological resources, including mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains, are more than 5,000 years old and occur mainly in Pleistocene or older sedimentary rock units.

2. California

California was occupied by different prehistoric cultures dating to at least 12,000 to 13,000 years ago. Evidence for the presence of humans during the Paleoindian Period prior to about 8,000 years ago is relatively sparse and scattered throughout the State;

most surface finds of fluted Clovis or Folsom projectile points or archaeological sites left by these highly mobile hunter-gatherers are associated with Pleistocene lakeshores, the Channel Islands, or the central and southern California coast (Rondeau et al 2007). Archaeological evidence from two of the Northern Channel Islands located off the coast from Santa Barbara indicates the islands were colonized by Paleoindian peoples at least 12,000 years ago, likely via seaworthy boats (Erlandson et al 2007). By 10,000 years ago, inhabitants of this coastal area were using fishhooks, weaving cordage and basketry, hunting marine mammals and sea birds, and producing ornamental shell beads for exchange with people living in the interior of the State (Erlandson et al 2007). This is the best record of early maritime activity in the Americas, and combined with the fluted points, indicates California was colonized by both land and sea during the Paleoindian period (Jones and Klar 2007).

With climate changes between 10,000 and 7,000 years ago at the end of the Pleistocene and into the early Holocene, Lower Archaic peoples adjusted to the drying of pluvial lakes, rise in sea level, and substantial alterations in vegetation communities. Approximately 6,000 years ago, vegetation communities similar to those of the present were established in the majority of the state, while the changes in sea level also affected the availability of estuarine resources (Jones and Klar 2007). The archaeological record indicates subsistence patterns during the Lower Archaic and subsequent Middle Archaic Period shifted to an increased emphasis on plant resources, as evidenced by an abundance of milling implements in archaeological sites dating between 8,000 and 3,000 years ago.

Approximately 3,000 years ago, during the Upper Archaic and Late Prehistoric Periods, the complexity of the prehistoric archaeological record reflects increases in specialized adaptations to locally available resources such as acorns and salmon, in permanently occupied settlements, and in the expansion of regional populations and trade networks (Moratto 1984; Chartkoff and Chartkoff 1984; Jones and Klar 2007). During the Upper Archaic, marine shell beads and obsidian continue to be the hallmark of long-distance trade and exchange networks developed during the preceding period (Hughes and Milliken 2007). Large shell midden/mounds at coastal and inland sites in central and southern California, for example, attest to the regular reuse of these locales over hundreds of years or more from the Upper Archaic into the Late Prehistoric period. In the San Francisco Bay region alone, over 500 shell mounds were documented in the early 1900s (Moratto 1984).

Changes in the technology used to pursue and process resources are some of the hallmarks of the Late Prehistoric period. These include an increase in the prevalence of mortars and pestles, a diversification in types of watercraft and fishhooks, and the earliest record for the bow and arrow in the State that occurs in both the Mojave Desert and northeast California nearly 2,000 years ago (Jones and Klar 2007). The period also witnessed the beginning of ceramic manufacture in the southeast desert region, southwest Great Basin, and parts of the Central Valley.

During the Late Prehistoric period, the development of social stratification and craft specialization accompanied the increase in sedentism, as indicated by the variety of

artifacts, including bone tools, coiled and twined basketry, obsidian tools, marine shell beads, personal ornaments, pipes, and rattles, by the use of clamshell disk beads and strings of dentalium shell as a form of currency, and by variation in burial types and associated grave goods (Moratto 1984; Jones and Klar 2007). Pictographs, painted designs that are likely less than 1,000 years old, and other non-portable rock art created during this period likely had a religious or ceremonial function (Gilreath 2007). Osteological evidence points to intergroup conflict and warfare in some regions during this period (Jones and Klar 2007), and there also appears to have been a decline or disruption in the long-distance trade of obsidian and shell beads approximately 1,200 years ago in parts of the State (Hughes and Milliken 2007).

b) Ethnographic Overview

At the time of European contact, California was the home of approximately 310,000 indigenous peoples with a complex of cultures distinguished by linguistic affiliation and territorial boundaries (Kroeber 1925, Cook 1978, Heizer 1978, Ortiz 1983, d'Azevedo 1986). At least 70 distinct native Californian cultural groups, with even more subgroups, inhabited the vast lands within the State. The groups and subgroups spoke between 74 and 90 languages, plus a large number of dialects (Shipley 1978: p. 80, University of California at Berkeley 2009-2010).

In general, these mainly sedentary, complex hunter-gatherer groups of indigenous Californians shared similar subsistence practices (hunting, fishing, and collecting plant foods), settlement patterns, technology, material culture, social organization, and religious beliefs (Kroeber 1925, Heizer 1978, Ortiz 1983, d'Azevedo 1986). Permanent villages were situated along the coast, interior waterways, and near lakes and wetlands. Population density among these groups varied, depending mainly on availability and dependability of local resources, with the highest density of people in the northwest coast and Santa Barbara Channel areas and the least in the State's desert region (Cook 1976). Networks of foot trails were used to connect groups to hunting or plant gathering areas, rock quarries, springs or other water sources, villages, ceremonial places, or distant trade networks (Heizer 1978).

The social organization of California's native peoples varied throughout the State, with villages or political units generally organized under a headman who was also the head of a lineage or extended family or achieved the position through wealth (Bean 1978). For some groups, the headman also functioned as the religious ceremonial leader. Influenced by their Northwest Coast neighbors, the differential wealth and power of individuals was the basis of social stratification and prestige between elites and commoners for the Chilula, Hupa, Karok, Tolowa, Wiyot, and Yurok in the northwest corner of the State. Socially complex groups were also located along the southern California coast where differential wealth resulted in hierarchical classes and hereditary village chiefs among the Chumash, Gabrielino, Juaneño, and Luiseño (Bean and Smith 1978, Arnold and Graesch 2004).

At the time of Spanish contact, religious practices among native Californian groups varied, but ethnographers have recognized several major religious systems (Bean and Vane 1978). Many of the groups in the north-central part of the State practiced the

Kuksu cult, primarily a ceremonial and dance organization, with a powerful shaman as the leader. Log drums, flutes, rattles, and whistles accompanied the elaborate ceremonial dances. The World Renewal cult in the northwestern corner of the State extended as far north as Alaska, entailed a variety of annual rites to prevent natural disasters, maintain natural resources and individual health, and were funded by the wealthy class. The *Toloache* cult was widespread in central and southern California and involved the use of narcotic plant (commonly known as datura or jimsonweed) materials to facilitate the acquisition of power. On the southern coast among Takic-speaking groups, the basis of Gabrielino, Juaneño, and Luiseño religious life was the *Chinigchinich* cult, which appeared to have developed from the Toloache cult. Chinigchinich, the last of a series of heroic mythological figures, gave instruction on laws and institutions, taught people how to dance, and later withdrew into heaven where he rewarded the faithful and punished those who disobeyed his laws. The Chinigchinich religion seems to have been relatively new when the Spanish arrived, and could have been influenced by Christianity.

Trade and exchange networks were a significant part of the economy and social organization among California's Native American groups (Heizer 1978). Obsidian, steatite, beads, acorns, baskets, animal skins, and dried fish were among the variety of traded commodities. Inland groups supplied obsidian from sources along the Sierra Nevada Mountains, in Napa Valley, and in the northeast corner of the State. Coastal groups supplied marine shell beads, ornaments, and marine mammal skins. In addition to trading specific items, clamshell disk beads made from two clam species available on the Pacific coast were widely used as a form of currency (Kroeber 1922). In northwestern California, groups used strings of dentalium shell as currency.

The effect of Spanish settlement and missionization in California marks the beginning of a devastating disruption of native culture and life ways, with forced population movements, loss of land and territory (including traditional hunting and gathering locales), enslavement, and decline in population numbers from disease, malnutrition, starvation, and violence during the historic period (Castillo 1978). In the 1830s, foreign disease epidemics swept through the densely populated Central Valley, adjacent foothills, and North Coast Ranges decimating indigenous population numbers (Cook 1978). By 1850, with their lands, resources and way of life being overrun by the steady influx of non-native people during the Gold Rush, California's native population was reduced to about 100,000; by 1900, there were only 20,000 or less than seven percent of the pre-contact number. Existing reservations were created in California by the federal government beginning in 1858 but encompass only a fraction of native lands.

In 2004, the Native American population in California was estimated at over 383,000 (Office of Planning and Research [OPR] 2005). Although acknowledged as non-federally recognized California Native American tribes on the contact list maintained by the Native American Heritage Commission, many groups continue to await federal tribal status recognition. There are currently 164 federally and non-federally recognized tribes within the state (Native American Heritage Commission 2018:15). Members of these tribes have specific cultural beliefs and traditions with unique connections to areas of California that are their ancestral homelands.

c) Historic Overview

Post-contact history for the State is generally divided into the Spanish period (1769–1822), Mexican period (1822–1848), and American period (1848–present). The establishment of Fort Ross by Alaska-based Russian traders also influenced post-contact history for a short period (1809–1841) in the region north of San Francisco Bay. Although there were brief visits along the Pacific coast by European explorers (Spanish, Russian, and British) between 1529 and 1769 of the territory claimed by Spain, the expeditions did not journey inland.

i) Spanish Period (1769–1822)

Spain's colonization of California began in 1769 with the overland expeditions from San Diego to San Francisco Bay by Lt. Colonel Gaspar de Portolá, and the establishment of a mission and settlement at San Diego. Between 1769 and 1823, the Spanish and the Franciscan Order established a series of 21 missions paralleling the coast along El Camino Real between San Diego and Sonoma (Rolle 1969). Between 1769 and 1782, Spain built four presidios (San Diego, Monterey, San Francisco, and Santa Barbara) to protect the missions, and by 1871 had established two additional pueblos at Los Angeles and San José.

Under Spanish law, large tracts of land, including cattle ranches and farms, fell under the jurisdiction of the missions. Native Americans were removed from their traditional lands, converted to Christianity, concentrated at the missions, and used as labor on the mission farms and ranches (Castillo 1978). Since the mission friars had civil as well as religious authority over their converts, they held title to lands in trust for indigenous groups. The lands were to be repatriated once the native peoples learned Spanish laws and culture.

ii) Russian Period (1809–1841)

In 1809, Alaska-based Russians started exploring the northern California coast with the goal of hunting otter and seal and feeding their Alaskan colonies. The first Russian settlement was established in 1811–1812 by the Russian–American Fur Company to protect the lucrative marine fur trade and to grow produce for their Alaskan colonies. In 1841, as a result of the decline in local sea otter population and the failure of their agricultural colony, combined with a change in international politics, the Russians withdrew from California (Schuyler 1978).

iii) Mexican Period (1822–1848)

Following independence from Spain in 1822, the economy during the Mexican period depended on the extensive rancho system, carved from the former Franciscan missions and at least 500 land grants awarded in the State's interior to Mexican citizens (Beck and Haase 1974; Staniford 1975). Captain John Sutter, who became a Mexican citizen, received the two largest land grants in the Sacramento Valley. In 1839, Sutter founded the trading and agricultural empire named New Helvetia that was headquartered at Sutter's Fort, near the confluence of the Sacramento and American Rivers in today's City of Sacramento (Hoover et al. 2002).

Following adoption of the Secularization Act of 1833, the Mexican government privatized most Franciscan lands, including holdings of their California missions. Although secularization schemes had called for redistribution of lands to Native American neophytes who were responsible for construction of the mission empire, the vast mission lands and livestock holdings were instead redistributed by the Mexican government through several hundred land grants to private, non-indigenous ranchers (Castillo 1978, Hoover et al. 2002). Most Native American converts returned to traditional lands that had not yet been colonized or found work with the large cattle ranchos being carved out of the mission lands.

iv) American Period (1848–present)

In 1848, shortly after California became a territory of the United States. with the signing of the Treaty of Guadalupe Hidalgo ending Mexican rule, gold was discovered on the American River at Sutter's Mill in Coloma. The resulting Gold Rush era influenced the history of the State, the nation, and the world. Thousands of people flocked to the gold fields in the Mother Lode region that stretches along the western foothills of the Sierra Nevada Mountains, and to the areas where gold was also discovered in other parts of the State, such as the Klamath and Trinity River basins (California Department of Transportation [Caltrans] 2008). In 1850, California became the 31st state, largely as a result of the Gold Rush.

d) Paleontological Setting

California's fossil record is exceptionally prolific with abundant specimens representing a diverse range of marine, lacustrine, and terrestrial organisms recovered from Precambrian rocks as old as 1 billion years to as recent as 6,000-year-old Holocene deposits (refer to geologic timescale in **Error! Reference source not found.A1-2**). These fossils provide key data for charting the course of the evolution or extinction of a variety of life on the planet, both locally and internationally. Paleontological specimens also provide key evidence for interpreting paleoenvironmental conditions, sequences and timing of sedimentary deposition, and other critical components of the earth's geologic history. Fossils are considered our most significant link to the biological prehistory of the earth (Jefferson 2004).

Table A1-2: Divisions of Geologic Time

Era	Period	Time in Millions of Years Ago (approximately)	Epoch
Cenozoic	Quaternary	< 0.01	Holocene
		2.6	Pleistocene
	Tertiary	5.3	Pliocene
		23	Miocene
		34	Oligocene
		56	Eocene
		65	Paleocene
Mesozoic	Cretaceous	145	

Table A1-2: Divisions of Geologic Time			
Era	**Period**	**Time in Millions of Years Ago (approximately)**	**Epoch**
	Jurassic	200	
	Triassic	251	
Paleozoic	Permian	299	
	Carboniferous	359	
	Devonian	416	
	Silurian	444	
	Ordovician	488	
	Cambrian	542	
Precambrian		2,500	

Source: USGS Geologic Names Committee 2010

Because the majority of the State was underwater until the Tertiary period, marine fossils older than 65 million years are not common and are exposed mainly in the mountains along the border with Nevada and the Klamath Mountains, and Jurassic shales, sandstones, and limestones are exposed along the edges of the Central Valley, portions of the Coast, Transverse, and Peninsular Ranges, and the Mojave and Colorado Deserts. Some of the oldest fossils in the State, extinct marine vertebrates called conodonts, have been identified at Anza-Borrego Desert SP in Ordovician sediments dating to circa 450 million years ago. Limestone outcrops of Pennsylvanian and Permian in the Providence Mountains SRA contain a variety of marine life, including brachiopods, fusulinids, crinoids, that lived some 300 to 250 million years ago.

Fossils from the Jurassic sedimentary layers in San Joaquin, San Luis Obispo, and Stanislaus counties include ammonites, bivalves, echinoderms and marine reptiles, all of which were common in the coastal waters. Gymnosperms (seed-bearing plants) such as cycads, conifers, and ginkgoes are preserved in terrestrial sediments from this period, evidence that the Jurassic climate was warm and moderately wet. In the great Central Valley, marine rocks record the position of the Cretaceous shoreline as the eroded ancestral Sierra Nevada sediments were deposited east of the rising Coast Ranges and became the rock layers of the Sacramento and San Joaquin valleys. These Cretaceous sedimentary deposits have yielded abundant fossilized remains of plants, bivalves, ammonites, and marine reptiles (Paleontology Portal 2003).

Along coastal southern California where steep coastal mountains plunged into the warm Pacific Ocean an abundance of fossil marine invertebrates, such as ammonites, nautilus, tropical snails and sea stars, have been found in today's coastal and near-coastal deposits from the Cretaceous Period. A rare armored dinosaur fossil dated to about 75 million years ago during the Cretaceous was discovered in San Diego County during a highway project. It is the most complete dinosaur skeleton ever found in California (San Diego Natural History Museum 2010). The lack of fossil remains of

the majority of earth's large vertebrates, particularly terrestrial, marine, and flying reptiles (dinosaurs, ichthyosaurs, mosasaurs, pleisosaurs, and pterosaurs), as well as many species of terrestrial plants, after the end of the Cretaceous and the start of the Tertiary periods 65 million years ago (the K-T boundary) attests to their abrupt extinction.

F. Energy Demand

1. United States

Petroleum, natural gas, coal, renewable energy, and nuclear electric power are primary energy sources. Electricity is a secondary energy source that is generated from primary energy sources. In 2016, U.S. energy mix comprised of (U.S. Energy Information Administration [EIA] 2017a):

- petroleum, 37 percent;
- natural gas, 29 percent;
- coal, 15 percent;
- renewable energy, 10 percent; and
- nuclear electric power, 9 percent.

Energy sources are measured in different physical units: liquid fuels in barrels or gallons, natural gas in cubic feet, coal in short tons, and electricity in kilowatts and kilowatt-hours. In the U.S., British thermal units (Btu), a measure of heat energy, is commonly used for comparing different types of energy to each other. In 2016, total U.S. primary energy consumption was about 97.4 quadrillion (1,015, or one thousand trillion) Btu (EIA 2017a).

In 2016, the shares of total primary energy consumption for the five energy-consuming sectors were (EIA 2017a):

- electric power, 39 percent;
- transportation, 29 percent;
- industrial, 22 percent;
- residential, 6 percent; and,
- commercial, 4 percent.

The three major fossil fuels (i.e., petroleum, natural gas, and coal) have dominated the U.S. energy mix for more than 100 years. Several recent changes in U.S. energy production have occurred (EIA 2017a):

- Coal production peaked in 2008 and trended downward through 2016. Coal production in 2016 was about the same as production was in 1977. The primary reason for the general decline in coal production in recent years is the decrease in coal consumption for electricity generation.
- Natural gas production in 2016 was the second largest amount after the record high in production in 2015. More-efficient and cost-effective drilling and

production techniques have resulted in increased production of natural gas from shale formations.

- Crude oil production generally decreased each year between 1970 and 2008. In 2009, the trend reversed, and production began to rise. More cost-effective drilling and production technologies helped to boost production, especially in Texas and North Dakota. In 2016, crude oil production was lower than production in 2015, mainly because of lower global crude oil prices.
- Natural gas plant liquids (NGPL) are hydrocarbon gas liquids that are extracted from natural gas before the natural gas is put into pipelines for transmission to consumers. NGPL production has increased alongside increases in natural gas production. In 2016, NGPL production reached a record high.
- Total renewable energy production and consumption both reached record highs of about 10 quadrillion Btu in 2016. Hydroelectric power production in 2016 was about 12 percent below the 50-year average, but increases in energy production from wind and solar helped to increase the overall energy production from renewable sources. Energy production from wind and solar were at record highs in 2016.

2. California

California's total energy consumption ranks among the highest in the nation, but, in 2015, the state's per capita energy consumption ranked 49th, due in part to its mild climate and its energy efficiency programs. Excluding federal offshore areas, California was the third-largest producer of petroleum among the 50 states in 2016, after Texas and North Dakota, and, as of January 2017, third in oil refining capacity, with a combined capacity of almost 2 million barrels per calendar day at the state's 18 operable refineries. In 2016, California ranked third in the nation in conventional hydroelectric generation, second in net electricity generation from all other renewable energy resources combined, and first as a producer of electricity from solar, geothermal, and biomass resources. California leads the nation in solar thermal electricity capacity and generation. In 2016, California had 73 percent of the nation's capacity and produced 71 percent of the nation's utility-scale electricity generation from solar thermal resources (EIA 2017b).

The California Energy Commission (CEC) is the State's primary energy policy and planning agency. Created by the Legislature in 1974, and located in Sacramento, six basic responsibilities guide the CEC as it sets state energy policy: forecasting future energy needs; promoting energy efficiency and conservation by setting the State's appliance and building efficiency standards; supporting public interest energy research that advances energy science and technology through research, development and demonstration programs; developing renewable energy resources and alternative renewable energy technologies for buildings, industry and transportation; licensing thermal power plants 50 megawatts or larger; and planning for and directing state response to energy emergencies.

The California Public Utilities Commission (CPUC) also plays a key role in regulating investor-owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC regulates investor-owned electric and natural gas utilities operating in California, including Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company, and Southern California Gas Company.

In 2016, California's in-state electricity generation sources consisted of:

- natural gas, 44.3 percent;
- renewable sources, 26.2 percent;
- nuclear, 9.5 percent;
- large hydropower, 12.3 percent; and,
- coal, 0.2 percent.

Approximately 63 percent of total electricity generation was from in-state sources, with the remaining electricity coming from out-of-state imports from the Pacific Northwest (12 percent) and the Southwest (21 percent) (CEC 2017).

G. Geology, Soils, and Mineral Resources

1. United States

The United States has a diverse, complex and seismically active geology that includes a vast array of landforms. Soils are as diverse as America's geology, and are described and characterized individually and collectively with other soils, and their various compatible uses in soil surveys published by the U.S. Department of Agriculture. Soils are fundamental and largely non-renewable resources that are the basis for high-level sustained yields of agricultural commodities, forest products, and provide support to the wide variety of ecological communities throughout the State.

The geology of the United States is very complex and can be divided into roughly five physiographic provinces: the American cordillera, the Canadian shield, the stable platform, the coastal plain, and the Appalachian orogenic belt. In Alaska, the geology is typical of the cordillera, whereas in Hawaii the major islands consist of Neogene volcanic erupted over a hotspot.

2. California

The state's topography is highly varied and includes 1,340 miles of seacoast, as well as high mountains, inland flat valleys, and deserts. Elevations in California range from 282 feet below sea level in Death Valley to 14,494 feet at the peak of Mount Whitney. The mean elevation of California is approximately 2,900 feet. The climate of California is as highly varied as its topography. Depending on elevation, proximity to the coast, and altitude, climate types include temperate oceanic, highland, sub-arctic, Mediterranean, steppe, and desert (U.S. Geological Survey [USGS] 1995). Precipitation in California is highly variable year-to-year and across the state. The southeast deserts

typically receive fewer than 5 inches a year and the north coast can often receive up to 100 inches per year, averaging about 50 inches across the state. Approximately 75 percent of the state's annual precipitation falls between October and April, primarily in the form of rain, except for at higher elevations in mountainous terrain (Department of Water Resources [DWR] 2014). Average annual precipitation ranges from more than 100 inches in the mountainous areas within the Smith River in Del Norte County to fewer than 2 inches in Death Valley, illustrating the extreme differences in precipitation levels within the State (Mount 1995). Overall, northern California is wetter than southern California with the majority of the State's annual precipitation occurring in the northern coastal region.

a) Geology

Plate tectonics and climate have played major roles in forming California's dramatic landscape. California is located on the active western boundary of the North American continental plate in contact with the oceanic Pacific Plate and the Gorda Plate north of the Mendocino Triple Junction. The dynamic interactions between these three plates and California's climate are responsible for the unique topographic characteristics of California, including rugged mountain ranges, long and wide flat valleys, and dramatic coastlines. Tectonics and climate also have a large effect on the occurrence natural environmental hazards, such as earthquakes, landslides, and volcanic formations.

b) Landslides

Landsliding or mass wasting is a common erosional process in California and has played an integral part in shaping the State's landscape. Typically, landslides occur in mountainous regions of the State, but they can also occur in areas of low relief, including coastal bluffs, along river and stream banks, and inland desert areas. Landsliding is the gravity-driven downhill mass movement of soil, rock, or both and can vary considerably in size, style and rate of movement, and type depending on the climate of a region, the steepness of slopes, rock type and soil depth, and moisture regime (Harden 1997).

c) Earthquakes

Earthquakes are a common and unpredictable occurrence in California. The tectonic development of California began millions of years ago by a shift in plate tectonics that converted the passive margin of the North American plate into an active margin of compressional and translational tectonic regimes. This shift in plate tectonics continues to make California one of the most geomorphically diverse, active, and picturesque locations in the United States While some areas of California are more prone to earthquakes, such as northern, central, and southern coastal areas of California, all areas of California are prone to the effects of ground shaking due to earthquakes. While scientists have made substantial progress in mapping earthquake faults where earthquakes are likely to occur, and predicting the potential magnitude of an earthquake in any particular region, they have been unable to precisely predict where or when an earthquake will occur and what its magnitude will be.

d) Tsunamis

Coastal communities around the circum Pacific have long been prone to the destructive effects of tsunamis. Tsunamis are a series of long-period, high-magnitude ocean waves that are created when an outside force displaces large volumes of water. Throughout time, major subduction zone earthquakes in both the Northern and Southern Hemispheres have moved the Earth's crust at the ocean bottom sending vast amounts of waters into motion and spreading tsunami waves throughout the Pacific Ocean.

Tsunamis can also occur from subareal and submarine landslides that displace large volumes of water. Subaeral landslide-generated tsunamis can be caused by seismically generated landslides, rock falls, rock avalanches, and eruption or collapse of island or coastal volcanoes. Submarine landslide-generated tsunamis are typically caused by major earthquakes or coastal volcanic activity. In contrast to a seismically generated tsunami, seismic seiches are standing waves that are caused by seismic waves traveling through a closed (lake) or semi-enclosed (bay) body of water. Due to the long-period seismic waves that originate after an earthquake, seiches can be observed several thousand miles away from the origin of the earthquakes. Small bodies of water, including lakes and ponds, are especially vulnerable to seismic seiches.

e) Volcanoes

A volcano is an opening in the Earth's crust through which magma escapes to the surface where it is extruded as lava. Volcanism may be spectacular, involving great fountains of molten rock, or tremendous explosions that are caused by the build-up of gases within the volcano (Ritchie and Gates 2001). Some of the most active volcanic areas in California are located within the Cascade Range - a volcanic chain that is a result of compressional tectonics along the Cascadia subduction zone.

f) Active Faults

A fault is defined as a fracture or zone of closely associated fractures along rocks that on one side have been displaced with respect to those on the other side. Most faults are the result of repeated displacement that may have taken place suddenly or by slow creep. A fault is distinguished from fractures or shears caused by landsliding or other gravity-induced surficial failures. A fault zone is a zone of related faults that commonly are braided and subparallel, but may be branching and divergent. A fault zone has significant width (with respect to the scale of the fault being considered, portrayed, or investigated), ranging from a few feet to several miles (Bryant and Hart 2007).

In the State of California earthquake faults have been designated as being active through a process that has been described by the 1972 Alquist-Priolo Earthquake Fault Zoning Act. An active fault is defined by the State as one that has "had surface displacement within Holocene time (about the last 11,000 years)." This definition does not, of course, mean that faults lacking evidence for surface displacement within Holocene time are necessarily inactive. A fault may be presumed to be inactive based on satisfactory geologic evidence; however, the evidence necessary to prove inactivity sometimes is difficult to obtain and locally may not exist.

The California Geological Survey (CGS) classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act of 1975 and assists in the designation of land containing significant aggregate resources. Mineral Resources Zones (MRZs) have been designated to indicate the significance of mineral deposits. The MRZ categories follow:

> **MRZ-1:** Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence.
>
> **MRZ-2:** Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
>
> **MRZ-3:** Areas containing mineral deposits the significance of which cannot be evaluated from available data.
>
> **MRZ-4:** Areas where available information is inadequate for assignment to any other MRZ.

California ranks as 7th in the United States for non-fuel mineral production, accounting for approximately 3.9 percent of the nation's total. In 2011, there were approximately 700 active mineral mines that produced: sand and gravel, boron, Portland cement, crushed stone, gold, masonry cement, clays, gemstones, gypsum, salt, silver, and other minerals (Clinkenbeard and Smith 2013).

H. Greenhouse Gases

1. United States

Greenhouse gases (GHG) retain heat in the atmosphere, contributing to global warming. The proposed cap-and-trade regulation would establish a limit (cap) on the emission of GHG expressed in million metric tons of carbon dioxide equivalent ($MMTCO_2e$). Gases subject to the cap are: carbon dioxide (CO_2), methane, nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). $MMTCO_2e$ is calculated based on the global warming potential (GWP) of different GHGs. GWP is a scale that normalizes other GHGs based on the heat retention properties of CO_2, which is assigned a value of 1.0. The GWP and atmospheric lifetimes of the GHG subject to the cap-and-trade regulation are presented below (Table A1-3).

Table A1-3

GHG	GWP (100 year, AR4)	Atmospheric Lifetime (years)
CO_2	1.0	Variable
N_2O	298	114
CH_4	25	12
SF_6	22,800	3,200

Table A1-3		
GHG	**GWP (100 year, AR4)**	**Atmospheric Lifetime (years)**
HFCs	Each HFC has its own GWP characteristics, ranging from 124 years (HFC-152a) to 14,800 years (HFC-23).	Most HFCs have atmospheric lifetimes of less than 15 years. The atmospheric lifetime of HFC-152a is about 1-year while the lifetime of HFC-23 is 270 years.
PFCs	The two most prolific anthropogenic PFCs are CF4 (tetrafluoromethane) and C2F6 (hexafluoroethane). The GWP of CF4 is 7,390 and the GWP of C2F6 is 12,200.	CF4 has an atmospheric lifetime of 50,000 years. C2F6 has an atmospheric lifetime of 10,000 years.
NF_3*	17,200*	740*
*Nitrogen Trifluoride is not included in the UNFCCC SAR Source: IPCC Fourth Assessment Report (AR4) (IPCC 2007)		

a) Attributing Climate Change—The Physical Scientific Basis

Climate change is a long-term shift in the climate of a specific location, region or planet. The shift is measured by changes in features associated with average weather, such as temperature, wind patterns, and precipitation. According to the Intergovernmental Panel on Climate Change (IPCC), a scientific body established by the World Meteorological Organization and by the United Nations Environment Programme, available scientific evidence supports the conclusion that most of the increased average global temperatures since the mid-20th century is very likely due to human-induced increases in GHG concentrations. GHGs, which are emitted from both natural and anthropogenic sources, include water vapor, carbon dioxide, methane, nitrous oxide, halocarbons, and ozone. These gases play a role in the “greenhouse effect” that helps regulate the temperature of the earth.

The current post-industrial warming trend differs alarmingly from past changes in the Earth’s climate because GHG emissions are higher and warming is occurring faster than at any other time on record within the past 650,000 years. Historical long-term as well as decadal and inter-annual fluctuations in the Earth’s climate resulted from natural processes such as plate tectonics, the Earth’s rotational orbit in space, solar radiation variability, and volcanism. The current trend derives from an added factor: human activities, which have greatly intensified the natural greenhouse effect, causing global warming. GHG emissions from human activities that contribute to climate change include the burning of fossil fuels (such as coal, oil and natural gas), cutting down trees (deforestation) and developing land (land-use changes). The burning of fossil fuels emits GHGs into the atmosphere, while deforestation and land-use changes remove trees and other kinds of vegetation that store (“sequester”) carbon dioxide. Emissions

of GHGs due to human activities have increased globally since pre-industrial times, with an increase of 70 percent between 1970 and 2004 (IPCC 2007).

A growing recognition of the wide-ranging impacts of climate change has fueled efforts over the past several years to reduce GHG emissions. In 1997, the Kyoto Protocol set legally binding emissions targets for industrialized countries and created innovative mechanisms to assist these countries in meeting these targets. The UN Climate Change Convention and the Kyoto Protocol (Kyoto Protocol) took effect in 2004, after 55 parties to the Convention had ratified it. Six major GHGs have been the focus of efforts to reduce emissions and are included in Assembly Bill (AB) 32: CO_2, methane, nitrous oxide (N_2O), HFCs, PFCs, and SF_6. They are regulated under the Kyoto Protocol. Nitrogen trifluoride (NF_3) was later added to the list of important GHGs to reduce and codified in California statute.

The "global warming potential" (GWP) metric is used to convert all GHGs into "CO_2-equivalent" (CO_2e) units for a specific time frame. GWPs from the IPCC fourth assessment report over a 100-year warming horizon are used as the national and international standard in GHG inventory development; however, GWPs over a 20-year time horizon are also available and can be more applicable for consideration of short-lived climate pollutants. Each gas's GWP is defined relative to CO_2 for the given time frame. For example, N_2O's 100-yr GWP is 298, meaning a unit mass of N_2O warms the atmosphere 298 times more than a unit mass of CO_2. SF_6 and PFCs have extremely long atmospheric lifetimes, resulting in their essentially irreversible accumulation in the atmosphere once emitted. However, in terms of quantity of emissions, CO_2 dominates world and U.S. GHG emissions.

Because the major GHGs have longer lives, they build up in the atmosphere so that past, present and future emissions ultimately contribute to total atmospheric concentrations. Thus, while reducing emissions of conventional air pollutants decreases their concentrations in the atmosphere in a relatively short time, atmospheric concentrations of the major GHGs can only be gradually reduced over years and decades. More specifically, the rate of emission of CO_2 currently greatly exceeds its rate of removal, and the slow and incomplete removal implies that small to moderate reductions in its emissions would not result in stabilization of CO_2 concentrations, but rather would only reduce the rate of its growth in coming decades. Many of the same activities that emit conventional air pollutants also emit GHGs (e.g., the burning of fossil fuels to produce electricity, heat or drive engines and the burning of biomass). Some conventional air pollutants also have greenhouse effects; for example, soot/black carbon and tropospheric ozone (see Short-Lived Climate Pollutants below).

b) Attributing Climate Change—Greenhouse Gas Emission Sources

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, electricity, industrial/manufacturing, utility, residential, commercial and agricultural sectors. In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation. Anthropogenic emissions of CO_2 are byproducts of fossil fuel combustion. Methane, a potent GHG, is

primarily emitted by livestock and landfills with a smaller contribution from fugitive emissions from oil and gas operations and natural gas transmission and distribution. N_2O is also largely attributable to agricultural practices, primarily from nitrogen-based fertilizer and manure application to soils.

CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect (i.e., GWP). The GWP is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, "Calculation References," of the General Reporting Protocol of the California Climate Action Registry (CCAR) 1 ton of methane has the same contribution to the greenhouse effect as approximately 25 tons of CO_2 (IPCC 2013; CCAR 2008). Therefore, methane is a much more potent GHG than CO_2. Expressing emissions in CO_2e takes the contributions of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

The California GHG inventory compiles statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, NF_3, HFCs, and PFCs. In 2016, statewide GHG emissions from GHG emitting activities were 429 $MMTCO_2e$. As a result, California has reached the target established in AB 32 to reduce statewide GHG emissions to 1990 levels (431 $MMTCO_2e$) by 2020 and has done so four years ahead of the target year. In 2016, 39 percent of statewide GHG emissions were generated from the transportation sector, 23 percent were generated from the industrial sector, and 16 percent were generated from the electricity sector. Between 2001 to 2016, statewide per capita GHG emissions dropped from a peak in 2001 of 14.0 $MTCO_2e$ per person to 10.8 $MTCO_2e$ in 2016. (CARB 2018).

c) Short-Lived Climate Pollutants

Climate policy and research have mainly concentrated on long-term climate change and controlling the long-lived GHGs. However, there is growing recognition within the scientific community that efforts to address climate change should also focus on near-term actions to reduce climate-warming substances with much shorter atmospheric lifetimes. These non-CO_2 pollutants, known as short-lived climate pollutants (SLCP), include methane, fluorinated gases including HFCs, and black carbon.

From a global perspective, SLCPs represent nearly 40 percent of the total climate pollutant emissions. In California, their contribution is smaller at around 30 percent. SLCPs have relatively short lifetimes in the atmosphere, but have significant GWP, which represent the ability to trap heat relative to CO_2. Since SLCPs remain in the atmosphere for periods of only a few days to a few decades, reducing their emissions results in immediate benefits. Thus, controlling sources of SLCPs is a critical climate strategy for reducing the near-term rate of global warming, particularly in regions most vulnerable to climate change.

California has established a strong track record with significant SLCP reductions as a co-benefit to its long-standing programs to clean up the air and protect public health. These include diesel engine controls, advanced clean cars, restrictions on burning,

development of a refrigerant management program, and landfill controls. In March 2017, CARB adopted the SLCP Reduction Strategy to further reduce SLCP emissions as a component of achieving statewide GHG reduction goals. The SLCP Reduction Strategy aims to reduce emissions of methane from the solid waste, agricultural, wastewater, and oil and gas sectors; reduce emissions of carbon dioxide through forest management practices; and reduce emissions of fluorinated gases through more stringent protocols regarding the use and manufacturing of refrigerants (CARB 2017).

i) Tropospheric Ozone

Ozone is a highly reactive and unstable gas. Stratospheric ozone, a layer of ozone high up in the atmosphere, is beneficial and absorbs ultraviolet radiation. Tropospheric (ground-level) ozone is a major air and climate pollutant. Tropospheric ozone is the main component of smog and causes serious health effects such as asthma and lung disease. Tropospheric ozone also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. Tropospheric ozone can act as a direct GHG and as an indirect controller of GHG lifetimes. As a strong oxidant, it affects the lifetimes and concentrations of atmospheric trace gases, including methane and HFCs.

Tropospheric ozone is not emitted directly into the air. It is created by photochemical reactions between NO_X and VOC emissions from vehicles, industrial facilities, consumer products and many other sources.

Ozone has long been recognized as a significant local and regional air quality issue due to its impacts on human health and the environment. Federal clean air laws require areas with unhealthy levels of ozone to develop plans, known as SIP. These plans include measures that describe how an area will attain federal ozone air quality standards. In addition to measures included in the SIP, the State has adopted several regulatory programs focused on controlling ozone forming compounds (NO_X and VOCs). These include the Low Emission Vehicle Programs, Off-Road Engine Standards, On-Road Heavy-Duty Diesel Vehicles Regulation, and Consumer Products Regulations.

ii) Methane

Methane is a potent and short-lived GHG. It is the second most prevalent GHG emitted in the U.S. from human activities. In addition to its climate forcing properties, methane also has several indirect effects including its role in contributing to global background ozone. As air quality standards tighten, reducing background ozone becomes more critical.

Enteric fermentation, manure management, landfills, natural gas transmission (methane is a significant constituent of natural gas), and wastewater treatment are the state's largest anthropogenic methane-producing sources.

Methane concentrations have been increasing due to human activities related to fossil fuel extraction and distribution, agriculture, and waste handling. Methane emissions are also contributed by non-anthropogenic or "natural" sources such as wetlands, oceans,

forests, fires, terrestrial arthropods (such as termites) and geological sources (such as submarine gas seepage, micro seepage over dry lands and geothermal seeps).

iii) Hydrofluorocarbons

HFCs are synthetic gases that are the fastest growing climate forcers in the U.S. as well as in many other countries. HFCs represent just three percent of all GHG emissions in California, but their warming effect is hundreds to thousands of times that of CO_2. HFCs are primarily produced for use as substitutes for ozone-depleting substances in refrigeration, air conditioning, insulating foams, solvents, aerosol products, and fire protection.

vi) Black Carbon

Black carbon is a subset of PM emissions and consists of small dark particles that result from incomplete combustion of fossil fuels, bio-fuels, and biomass. It contributes to climate change both directly by absorbing sunlight, and indirectly by depositing on snow and by interacting with clouds and affecting cloud formation.

Unlike other GHGs, black carbon has a very short atmospheric lifetime (an average of about a week), resulting in a strong correlation to regional emission sources. As a result, emission reductions have immediate benefits for climate and health.

The main sources of black carbon in California are wildfires, off-road vehicles (e.g., locomotives, marine vessels, tractors, excavators, dozers), on-road vehicles (e.g., cars, trucks, and buses), fireplaces, agricultural burning (burning agricultural waste), and prescribed burning (planned burns of forest or wildlands). California has been an international leader in reducing black carbon, with 90 percent control since the early 1960s and close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities.

Recent CARB estimates suggest that the annual black carbon emissions in California decreased about 70 percent between 1990 and 2010, in direct proportion to declining diesel PM emissions – a co-benefit of CARB's regulations on diesel engines. Other categories of diesel engines, such as off-road diesels (e.g., agricultural and construction equipment), building equipment and diesel generators, are also projected to have major declines in diesel PM emissions. Efforts to manage agricultural, forest, and range land management burning operations are expected to continue reducing black carbon emissions.

e) Adaptation to Climate Change

According to IPCC global average temperature is expected to increase by 3 to 7°F by the end of the century, depending on future GHG emission scenarios (IPCC 2013). Resource areas other than air quality and global average temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides water supply (runoff) and

storage (within the snowpack before melting), which is a major source of supply for the state.

According to the CEC (2012), statewide average temperatures increased by about 1.7 degrees Fahrenheit from 1895 to 2011. Throughout the past century, precipitation (i.e., rain and snow) has followed the expected pattern of a largely Mediterranean climate with wet winters and dry summers, and considerable variability from year to year. No consistent trend in the overall amount of precipitation has been detected, except that a larger proportion of total precipitation is falling as rain instead of snow. In addition, during the last 35 years, the Sierra Nevada range has witnessed both the wettest and the driest years on record of more than 100 years. While intermittent droughts have been a common feature of the State's climate, evidence from tree rings and other indicators reveal that, over the past 1,500 years, California has experienced dry spells that persisted for several years or even decades (CEC 2012).

The effects of global climate change could lead to a variety of secondary effects to public health, water supply, energy supply, sea level, wildfire risks, and ecosystems. Recent data, climate projections, topographic, demographic, and land use information have led to the findings that:

- The state's electricity system is more vulnerable than was previously understood.
- The Sacramento-San Joaquin Delta is sinking, putting levees at growing risk.
- Wind and waves, in addition to faster rising seas, will worsen coastal flooding.
- Animals and plants need connected "migration corridors" to allow them to move to more suitable habitats to avoid serious impacts.
- Native freshwater fish are particularly threatened by climate change.
- Minority and low-income communities face the greatest risks from climate change.
- There are effective ways to prepare for and manage climate change risks, but local governments face many barriers to adapting to climate change; these can be addressed so that California can continue to prosper.

At the same time, the State has recognized the need to adapt to climate change impacts that can no longer be avoided. In 2014, the California Natural Resources Agency released the Safeguarding California Plan, which serves as an update to the 2009 California Climate Adaptation Strategy. The many adaptation planning efforts underway in virtually every State agency, in regional and local communities such as Chula Vista, San Diego, Los Angeles, Santa Barbara, Santa Cruz, San Francisco, Hayward, Marin County, Sacramento, and others, as well as in private businesses suggest that CEOs, elected officials, planners, and resource managers understand the reality that California and the world is facing.

In fact, the latest climate science makes clear that State, national and global efforts to mitigate climate change must be accelerated to limit global warming to levels that do not endanger basic life-support systems and human well-being. Success in mitigation will keep climate change within the bounds that allow ecosystems and society to adapt

without major disruptions. Further advances in integrated climate change science can inform California's and the world's climate choices and help ensure a resilient future (CEC 2012).

2. California

California has four main climatic regions. Mild summers and winters prevail in central coastal areas, where temperatures are more equable than virtually anywhere else in the United States. For example, differences between average summer and winter temperatures between San Francisco and Monterey are seldom more than 10 degrees Fahrenheit (°F) (6 degrees Celsius [°C]). During the summer there are heavy fogs in San Francisco and all along the coast. Mountainous regions are characterized by milder summers and colder winters, with markedly low temperatures at high elevations. The Central Valley has hot summers and cool winters, while the Imperial Valley and eastern deserts are marked by very hot, dry summers, with temperatures frequently exceeding 100°F (38°C).

Average annual temperatures for the state range from 47°F (8°C) in the Sierra Nevada to 73°F (23°C) in the Imperial Valley. The highest temperature ever recorded in the United States was 134°F (57°C), registered in Death Valley on 10 July 1913. Death Valley has the hottest average summer temperature in the Western Hemisphere, at 98°F (37°C). The state's lowest temperature was -45°F (-43°C), recorded on 20 January 1937 at Boca, near the Nevada border.

Among the major population centers, Los Angeles has an average annual temperature of 63°F (17°C), with an average January minimum of 48°F (9°C) and an average July maximum of 75°F (24°C). San Francisco has an annual average of 57°F (14°C), with a January average minimum of 42°F (6°C) and a July average maximum of 72°F (22°C). The annual average in San Diego is 64°F (18°C), the January average minimum 49°F (9°C), and the July average maximum 76°F (24°C). Sacramento's annual average temperature is 61°F (16°C), with January minimums averaging 38°F (3°C) and July maximums of 93°F (34°C).

Annual precipitation varies from only 2 inches (in) (5 centimenters [cm]) in the Imperial Valley to 68 in (173 cm) at Blue Canyon, near Lake Tahoe. San Francisco had an average annual precipitation (1971–2000) of 20 in (51 cm), Sacramento 17.9 in (45.5 cm), Los Angeles 13.2 in (33.5 cm), and San Diego 10.8 in (27.4 cm). The largest one-month snowfall ever recorded in the United States, 390 in (991 cm), fell in Alpine County in January 1911. Snow averages between 300 and 400 in (760 to 1,020 cm) annually in the high elevations of the Sierra Nevada, but is rare in the Central Valley and coastal lowlands.

Sacramento has the greatest percentage (73 percent) of possible annual sunshine among the State's largest cities; Los Angeles has 72 percent and San Francisco 71 percent. San Francisco is the windiest, with an average annual wind speed of 11 miles per hour (18 kilometers per hour). Tropical rainstorms occur often in California during the winter.

I. Hazards and Hazardous Materials

1. United States

Hazardous materials are substances with physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into four categories based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials) and reactive (causes explosions or generates toxic gases). A hazardous waste is any hazardous material that cannot be safely disposed in the trash or poured down sinks and storm drains. This includes items, such as fuels, industrial solvents and chemicals, process water, and spent materials (e.g., foams).

Naturally occurring hazardous materials in the U.S. include asbestos, radon, and mercury. Asbestos is a naturally occurring mineral composed of long, thin, fibrous crystals. Asbestos is found in 20 U.S. states and has been mined in 17 of these states, including the Appalachian region, California, and Oregon. Mercury is a chemical element that comes from both natural sources and human activities. Natural sources of mercury include volcanoes, hot springs, and natural mercury deposits. Sources related to human activities include coal combustion and certain industrial and mining activities. Radon is a gas that forms during the decay of uranium that is naturally found in rock, water, and soil. It migrates to the surface through cracks or fractures in the Earth's crust.

2. California

Health and Safety Code Section 25501 defines "hazardous materials," in part, as any material identified in statute that, "because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment." Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering regulatory agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment. A number of properties may cause a substance to be considered hazardous, including toxicity (causes human health effects), ignitibility (can burn), corrosivity (causes severe burns or damage to materials), and reactivity (causes explosions or generates toxic gases). A hazardous waste is a waste with a chemical composition or other properties that make it capable of causing illness, death, or some other harm to humans and other life forms when mismanaged or released into the environment. This may include items, such as spent fuels, industrial solvents and chemicals, process water, and other spent materials (i.e., some types of batteries and fuel cells). California's hazardous waste regulations provides the following means to determine whether or not a waste is hazardous: (1) a list of criteria (toxic, ignitable, corrosive and reactive) that a waste may exhibit; (2) a list of those wastes that are subject to regulation; and (3) a list of chemical names and common names that are

presumed to be hazardous in California. The California Hazardous Waste Control Law recognizes more than 780 hazardous chemicals and nearly 30 additional common materials that may be hazardous.

Naturally occurring hazardous materials are also found in California, including asbestos. Naturally occurring asbestos is also often found in a type of rock (serpentine) located in the California Coast Ranges and Sierra foothills.

J. Hydrology and Water Quality

1. United States

Surface waters occur as streams, lakes, ponds, coastal waters, lagoons, estuaries, floodplains, dry lakes, desert washes, wetlands and other collection sites. Water bodies modified or developed by man, including reservoirs and aqueducts, are also considered surface waters. Surface water resources are very diverse throughout the state, due to the high variance in tectonics, topography, geology/soils, climate, precipitation, and hydrologic conditions.

2. California

a) Surface Waters

Surface waters occur as streams, lakes, ponds, coastal waters, lagoons, estuaries, floodplains, dry lakes, desert washes, wetlands, and other collection sites. Water bodies modified or developed by man, including reservoirs and aqueducts, are also considered surface waters. Surface water resources are very diverse throughout the state, due to the high variance in tectonics, topography, geology/soils, climate, precipitation, and hydrologic conditions. Overall, California has the most diverse range of watershed conditions in the United States, with varied climatic regimes ranging from Mediterranean climates with temperate rainforests in the north coast region to desert climates containing dry desert washes and dry lakes in the southern central region.

The average annual runoff for the State is 71 million acre-feet (DWR 2003). The State has more than 60 major stream drainages and more than 1,000 smaller, but significant drainages that drain coastal mountains and inland mountainous areas. High snowpack levels and resultant spring snowmelt yield high surface runoff and peak discharge in the Sierra Nevada and Cascade Mountains that feed surface flows, fill reservoirs, and recharge groundwater. Federal, state, and local engineered water projects, aqueducts, canals, and reservoirs serve as the primary conduits of surface water sources to areas that have limited surface water resources. Most of the surface water storage is transported for agricultural, urban, and rural residential needs to the San Francisco Bay Area and to cities and areas extending to southern coastal California. Surface water is also transported to southern inland areas, including Owens Valley, Imperial Valley, and Central Valley areas.

b) Groundwater

The majority of runoff from snowmelt and rainfall flows down mountain streams into low gradient valleys and either percolates into the ground or is discharged to the sea. This percolating flow is stored in alluvial groundwater basins that cover approximately 40 percent of the geographic extent of the State (DWR 2003). Groundwater recharge occurs more readily in areas underlain by coarse sediments, primarily in mountain base alluvial fan settings. As a result, most of California's groundwater basins are located in broad alluvial valleys flanking mountain ranges, such as the Cascade Range, Coast Ranges, Transverse Ranges, and the Sierra Nevada.

There are 250 major groundwater basins that serve approximately 30 percent of California's urban, agricultural, and industrial water needs, especially in southern portion of San Francisco Bay, the Central Valley, greater Los Angeles area, and inland desert areas where surface water is limited. On average, more than 15 million acre-feet of groundwater are extracted each year in the state, of which more than 50 percent is extracted from 36 groundwater basins in the Central Valley.

c) Water Quality

Land uses have a great effect on surface water and groundwater water quality in the State of California. Water quality degradation of surface waters occurs through nonpoint- and point- source discharges of pollutants. Nonpoint source pollution is defined as not having a discrete or discernible source and is generated from land runoff, precipitation, atmospheric deposition, seepage, and hydrologic modification (U.S. EPA 1993). Nonpoint-source pollution includes runoff containing pesticides, insecticides, and herbicides from agricultural areas and residential areas; acid drainage from inactive mines; bacteria and nutrients from septic systems and livestock; VOCs and toxic chemicals from urban runoff and industrial discharges; sediment from timber harvesting, poor road construction, improperly managed construction sites, and agricultural areas; and atmospheric deposition and hydromodification. In comparison, point-source pollution is generated from identifiable, confined, and discrete sources, such as a smokestack, sewer, pipe or culvert, or ditch. These pollutant sources are regulated by U.S. EPA and the State Water Resources Control Board (SWRCB) through Regional Water Quality Control Board (RWQCB). Many of the pollutants discharged from point-sources are the same as for nonpoint-sources, including municipal (bacteria and nutrients), agricultural (pesticides, herbicides, and insecticides), and industrial pollutants (VOCs and other toxic effluent).

K. Land Use and Planning

1. United States

The way physical landscapes are used or developed is commonly referred to as land use. Public agencies are the primary entities that determine the types of land use changes that can occur for specific purposes within their authority or jurisdiction. In most states, land uses decisions are made by local governments.

2.California

In California, the State Planning and Zoning Law (California Government Code section 65000 et seq.) provides the primary legal framework that cities and counties must follow in land use planning and controls. Planned land uses are designated in the city or county general plan, which serves as the comprehensive master plan for the community. Also, city and county land use and other related resource policies are defined in the General Plan. The primary land use regulatory tool provided by the California Planning and Zoning Law is the zoning ordinance adopted by each city and county. Planning and Zoning Law requirements are discussed in the regulatory setting below.

When approving land use development, cities and counties must comply with CEQA, which requires that they consider the significant environmental impacts of their actions and the adoption of all feasible mitigation measures to substantially reduce significant impacts, in the event a project causes significant or potentially significant effects on the environment. In some cases, building permits may be ministerial, and therefore exempt from CEQA, but most land use development approval actions by cities and counties require CEQA compliance.

Land use decisions in California are also be governed by state agencies such as the California Coastal Commission, California State Lands Commission, California Department of Parks and Recreation, and others, where the state has land ownership or permitting authority with respect to natural resources or other state interests.

L. Noise

1. United States and California

a) Acoustic Fundamentals

Acoustics is the scientific study that evaluates perception, propagation, absorption, and reflection of sound waves. Sound is a mechanical form of radiant energy, transmitted by a pressure wave through a solid, liquid, or gaseous medium. Sound that is loud, disagreeable, unexpected, or unwanted is generally defined as noise. Common sources of environmental noise and noise levels measured in decibels (dB) are presented in **Table A1-4**.

Table A1-4: Typical Noise Levels

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet	100	--
Gas lawnmower at 3 feet	90	--

Table A1-4: Typical Noise Levels		
Common Outdoor Activities	**Noise Level (dB)**	**Common Indoor Activities**
Diesel truck moving at 50 mph at 50 feet	80	Food blender at 3 feet, Garbage disposal at 3 feet
Noisy urban area, Gas lawnmower at 100 feet	70	Vacuum cleaner at 10 feet, Normal speech at 3 feet
Commercial area, Heavy traffic at 300 feet	60	
Quiet urban daytime	50	Large business office, Dishwasher in next room
Quiet urban nighttime	40	Theater, Large conference room (background)
Quiet suburban nighttime	30	Library, Bedroom at night, Concert hall (background)
Quiet rural nighttime	20	Broadcast/Recording Studio
	10	--
Threshold of Human Hearing	0	Threshold of Human Hearing

Notes: dB=A-weighted decibels; mph=miles per hour
Source: Caltrans 2013a: p.2-20.

b) Sound Properties

A sound wave is initiated in a medium by a vibrating object (e.g., vocal chords, the string of a guitar, the diaphragm of a radio speaker). The wave consists of minute variations in pressure, oscillating above and below the ambient atmospheric pressure. The number of pressure variation cycles occurring per second is referred to as the frequency of the sound wave and is expressed in hertz.

Directly measuring sound pressure fluctuations would require the use of a very large and cumbersome range of numbers. To avoid this and have a more useable numbering system, the dB scale was introduced. A sound level expressed in decibels is the logarithmic ratio of two like pressure quantities, with one pressure quantity being a reference sound pressure. For sound pressure in air the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly added. For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB

corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100-fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. The standard weighting networks are identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted sound levels (dBA). For this reason the dBA can be used to predict community response to noise from the environment, including noise from transportation and stationary sources. Sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise.

Noise can be generated by a number of sources, including mobile sources (transportation noise sources) such as automobiles, trucks, and airplanes and stationary sources (nontransportation noise sources) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers (walls, building façades, berms). Noise generated from mobile sources generally attenuate at a rate of 4.5 dB per doubling of distance. Stationary noise sources spread with more spherical dispersion patterns that attenuate at a rate of 6 to 7.5 dB per doubling of distance.

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a large object (e.g., barrier, topographic features, and intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction or “shielding” provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural barriers such as berms, hills, or dense woods, and human-made features such as buildings and walls may be used as noise barriers.

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dB with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30 to 40 dB with its windows closed (Caltrans 2011).

c) Noise Descriptors

The intensity of environmental noise fluctuates over time, and several different descriptors of time-averaged noise levels are used. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution,

duration, and fluctuation of both the noise source and the environment. The noise descriptors most often in relation to the environment are defined below (Caltrans 2013a).

- **Equivalent Noise Level (L_{eq}):** The energy mean (average) noise level.
- **Maximum Noise Level (L_{max}):** The highest A/B/C weighted integrated noise level occurring during a specific period of time.
- **Minimum Noise Level (L_{min}):** The lowest A/B/C weighted integrated noise level during a specific period of time.
- **Day-Night Noise Level (L_{dn}):** The 24-hour L_{eq} with a 10-dB "penalty" applied during nighttime noise-sensitive hours, 10 p.m. through 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to the L_{dn} described above, but with an additional 5-dB "penalty" for the noise-sensitive hours between 7 p.m. to 10 p.m., which are typically reserved for relaxation, conversation, reading, and watching television.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the L_{eq} descriptor listed above, which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise.

d) Effects of Noise on Humans

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The mass of research infers that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing

noise environment. The greater the change in the noise levels that are attributed to a new noise source, relative to the environment an individual has become accustom to, the less tolerable the new noise source will be perceived.

With respect to how humans perceive and react to changes in noise levels, a 1 dB increase is imperceptible, a 3 dB increase is barely perceptible, a 6 dB increase is clearly noticeable, and a 10 dB increase is subjectively perceived as approximately twice as loud (Egan 2007:21). These subjective reactions to changes in noise levels was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dB, as this is the usual range of voice and interior noise levels. For these reasons, a noise level increase of 3 dB or more is typically considered substantial in terms of the degradation of the existing noise environment.

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss both may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise, and the exposure time (Caltrans 2013a).

e) Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery or transient in nature, explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (Federal Transit Administration [FTA] 2006; Caltrans 2013b). PPV and RMS vibration velocity are normally described in inches per second.

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. The response of the human body to vibration relates well to average vibration amplitude; therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity. Similar to airborne sound, vibration velocity can be expressed in decibel notation as vibration decibels (VdB). The logarithmic nature of the decibel serves to compress the broad range of numbers required to describe vibration (FTA 2006). This is based on a reference value of 1 micro inch/second.

The typical background vibration-velocity level in residential areas is approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006).

Typical outdoor sources of perceptible groundborne vibration include construction equipment, steel-wheeled trains, and traffic on rough roads. Although the effects of vibration may be imperceptible at low levels, effects may result in detectable vibrations and slight damage to nearby structures at moderate and high levels, respectively. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in damage to structural components. The range of vibration that is relevant to this analysis occurs from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings (FTA 2006).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. **Table A1-5** describes the general human response to different levels of groundborne vibration-velocity levels.

Table A1-5: Human Response to Different Levels of Groundborne Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Notes: VdB = vibration decibels referenced to 1 micro inch per second and based on the RMS velocity amplitude.
Source: FTA 2006: pp. 7-8.

f) Existing Sources and Sensitive Land Uses

The existing noise environment in the project area is primarily influenced by transportation noise from vehicle traffic on the roadway systems (e.g., highways, freeways, primary arterials, and major local streets) and non-transportation noise from commercial and industrial operations. Other noise sources that contribute to the existing noise environment include passenger and freight on-line railroad operations and ground rapid transit systems; commercial, general aviation, heliport, and military airport operations (e.g., jet engine test stands, ground facilities and maintenance) and overflights; and to a much lesser extent construction sites, schools (e.g., play fields), residential and recreational areas (e.g., landscape maintenance activities, dogs barking, people talking), agricultural activities, and others. Those noted above are also considered sources of vibration in the project area. With regards to the covered entities, existing noise conditions vary depending on location, but are typically characterized as noisy urban industrial areas including such noise sources as stationary machinery, transportation (e.g., surface vehicles, heavy-duty diesel trucks, construction equipment), and other industrial-related activities. Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Places of worship and transit lodging, and other places where low interior noise levels are essential are also considered noise-sensitive.

Those noted above are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance. Equipment such as electron microscopes and high-resolution lithographic equipment can be very sensitive to vibration, and even normal optical microscopes will sometimes be difficult to use when vibration is well below the human annoyance level. Manufacturing of computer chips is an example of a vibration-sensitive process. This category does not include most computer installations or telephone switching equipment because most such equipment is designed to operate in typical building environments where the equipment may experience occasional shock from bumping and continuous background vibration caused by other equipment (FTA 2006).

M. Population and Housing

1. United States

The employed civilian labor force, unemployment rates, employment opportunities, and population estimates and projections for cities, counties, and states are collected every 10 years by the Census. The estimated population in 2017 for the United States, was approximately 325,719,178, and the estimated number of housing units was 135,697,926 (Census 2018). The estimated average number of persons per household in 2017 was 2.64 in the United States in 2017 (Census 2018). In February 2018, the

unemployment rate in the United States declined from 5.0 percent in February 2016 to 4.1 (Bureau of Labor Statistics [BLS] 2018a).

2. California

a) Population

According to the Census data, the estimated population of California in 2017 was 39,536,563 (Census 2018). Since California became a state in 1850, the population has been increasing rapidly. Within the first 150 years of California's statehood, the population increased from fewer than 100,000 citizens to almost 34 million in 2000 (Census 2001). It is expected that the population of California will reach and surpass the 50-million mark sometime between 2040 and 2050 if the current growth rates persist (University of Southern California 2012).

b) Housing

As population within the State increases, housing distribution and household conditions are expected to evolve. Estimated housing units, households, and vacancy rates for the State of California in 2013 are shown below in Table A1-6. Data was derived from the 2010 Census (Census 2018).

Table A1-6: California Housing Profile	
Total Housing Units	13,680,081
Total households	12,577,498
Vacant housing units	1,102,583
Owner-occupied	7,035,371
Renter-occupied	15,691,211
Homeowner vacancy rate	2.1
Rental vacancy rate	6.3

Source: Census 2018.

c) Employment

In 2018, the civilian labor force in California was approximately 19,393,000, and the unemployment rate decreased from 4.5 percent in September 2017 to 4.3 percent in February 2018 (BLS 2018b).

N. Public Services

1. United States

In the United States, the Federal Bureau of Investigation (FBI) is an agency of the U.S. Department of Justice that serves as both a federal criminal investigative body and an

internal intelligence agency. The FBI's main goal is to protect and defend the U.S. against terrorist and foreign intelligence threats, to uphold and enforce the criminal laws of the United States, and to provide leadership and criminal justice services to federal, state, municipal, and international agencies and partners. The U.S. EPA is an agency of the federal government of the United States charged with protecting human health and the environment, by writing and enforcing regulations based on laws passed by Congress. The U.S. EPA's Criminal Investigation Division's primary mission is the enforcement of the United States' environmental laws as well as any other federal law in accordance with the guidelines established by the Attorney General of the United States (18 U.S.C. 3063). These environmental laws include those specifically related to air, water, and land resources. USFS is an agency of USDA that administers the nation's 155 national forests and 20 national grasslands, including fire protection and response services. Major divisions of the agency include the National Forest System, State and Private Forestry, and the Research and Development branch. The Fire and Aviation Management part of USFS works to advance technologies in fire management and suppression, maintain and improve the extremely efficient mobilization and tracking systems in place, and reach out in support of federal, state, and international fire partners.

Education is primarily a State and local responsibility in the U.S. communities, as well as public and private organizations, establish schools, develop curricula, and determine requirements for enrollment and graduation.

2. California

a) Law Enforcement

California's environmental laws are enforced by a matrix of State and local agencies, some at the California Environmental Protection Agency (CalEPA), each charged with enforcing the laws governing a specific media such as air, water, hazardous waste, solid waste, and pesticide laws, the Attorney General's Office, local District Attorneys and City Attorneys. The Attorney General represents the people of California in civil and criminal matters before trial courts, appellate courts and the supreme courts of California and the United States. Regarding environmental issues, the Attorney General enforces laws that safeguard the environment and natural resources in the state. Recent actions by the Attorney General related to air quality and climate change issues include filing numerous actions against the Trump Administration opposing federal rollbacks of environmental protection regulations and requiring implementation of existing rules. These actions involve a range of regulations, including those concerning greenhouse gas emissions from stationary sources and vehicles, regulations of toxic air pollution, and planning requirements for criteria pollution planning. The Attorney General also continues to work broadly to support CARB actions, including working with local governments to ensure that land use planning processes take account of global warming, promoting renewable energy and enhanced energy efficiency in California, and working with other State leaders and agencies to implement AB 32, the Global Warming Solutions Act of 2006.

CalEPA was created in 1991 by Governor's Executive Order (EO). CalEPA's mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality. The CalEPA is comprised of various boards, departments and offices, including: CARB, California Department of Pesticide Regulation (DPR), California Department of Toxic Substances Control (DTSC), Office of Environmental Health Hazard Assessment (OEHHA), and SWRCB (including the nine RWQCBs).

California's environmental laws are enforced by state and local agencies, each charged with enforcing the laws governing a specific media such as air, water, hazardous waste, solid waste, and pesticides. Enforcement agencies for these media are as follows:

- Air: CARB (part of CalEPA) and Local Air Districts.
- Water: SWRCB (part of CalEPA), RWQCBs (part of CalEPA), local waste water officials, and the California Department of Public Health.
- Hazardous Waste: DTSC (part of CalEPA) and Certified Unified Program Agencies (CUPA).
- Carcinogens/Reproductive Toxins: Prop. 65 through the OEHHA (part of CalEPA).
- Pesticides: Department of Pesticide Regulation (part of CalEPA) and County Agricultural Commissioners

Statewide law enforcement service is provided by the California Highway Patrol, which is responsible for protecting State resources and providing crime prevention services and traffic enforcement along the State's highways and byways.

Community law enforcement service is provided by local police and sheriff agencies (i.e., cities and counties, respectively) to prevent crime, respond to emergency incidents, and provide traffic enforcement on local roadways.

b) Fire Protection and Emergency Medical Response Services

State-level fire protection and emergency response service is provided by the California Department of Forestry and Fire Protection (CAL FIRE), primarily in rural areas of the State. CAL FIRE is an emergency response and resource protection department. CAL FIRE protects lives, property and natural resources from fire, responds to emergencies of all types, and protects and preserves timberlands, wildlands, and urban forests.

Local and urban fire protection service is provided by local fire districts and/or local agencies (e.g., fire departments of cities and counties). In addition to providing fire response services most fire agencies also provide emergency medical response services (i.e., ambulance services) within their service areas.

c) Schools

Statewide, the regulation of education for youth is provided by the California Department of Education. The State Board of Education (SBE) is the governing and policy-making body of the California Department of Education. The SBE sets K-12 education policy in the areas of standards, instructional materials, assessment, and accountability. Locally, school districts are responsible for the management and development of elementary, middle, and high-school facilities.

O. Recreation

1. United States and Canada

Recreational resources and facilities are provided and managed at federal, state, and local levels. Recreation resources include national parks and monuments, national forests and grasslands, wildlife refuges, wilderness areas, lakes and lands managed by different agencies in the federal government, wild and scenic rivers, and back country byways, national trials, and marine reserves and estuaries.

2. California

California contain approximately 14,000 parks, managed by nearly 1,000 agencies (California State Parks [CSP] 2018). The California Outdoor Recreation Plan and associated research provide policy guidance to all public agencies – federal, state, local, and special districts that oversee outdoor recreation on lands, facilities, and services throughout California. Agencies and departments that are involved in recreational activities include Boating and Waterways, Fish and Wildlife, Tahoe Regional Planning Association, various conservancies, and others.

Recreational lands and facilities are also managed by regional and local park and recreation agencies and open space districts. City and county general plans contain recreation elements that provide framework for planning agencies to consider when projects are developed and implemented.

P. Transportation and Traffic

1. United States, Canada, and California

Existing roadway systems in-state and in out-of-state areas generally consist of highways, freeways, arterials, local streets, and intersections/ramps. The existing average annual daily traffic volumes on the roadway segments that comprise these systems vary considerably (i.e., from hundreds to hundreds of thousands). The level of service (LOS), a scale used to determine the operating quality of a roadway segment or intersection based on volume-to-capacity ratio or average delay, also vary from LOS A, the best and smoothest operating conditions, to LOS F, most congested operating conditions. Other roadway and traffic volume characteristics such as roadway length, number of lanes and facility type (e.g., two-lane freeway), right-of-way width and pavement width, terrain classification (e.g., flat), percent of heavy-duty truck traffic, and

accident rates (e.g., number of accidents per million vehicle miles traveled) also vary substantially depending on the location. In addition to the roadway systems, circulation networks provide additional transportation opportunities and include mass transit, airports, and non-motorized travel (e.g., pedestrian and bicycle paths).

Q. Utilities and Service Systems

1. United States

The U.S. Bureau of Reclamation (USBR) is a federal agency and it is the largest wholesaler of water in the United States and the second largest producer of hydroelectric power (USBR 2017). The Federal Power Commission regulates both the interstate transmission of electricity and the sale of hydroelectric power at the wholesale level in the United States, and the Federal Energy Regulatory Commission (FERC) has authority over intrastate as well as interstate natural gas production.

2. California

a) Water Supply and Distribution

The principal water supply facilities in California are operated by the USBR and DWR. In California, the Mid-Pacific Region of the USBR is responsible for the management of the Central Valley Project (CVP). The CVP serves farms, homes, and industry in California's Central Valley as well as the major urban centers in the San Francisco Bay Area. The CVP consists of 20 dams and reservoirs, 11 power plants, and 500 miles of major canals and reaches from the Cascade Mountains near Redding in the north to the Tehachapi Mountains near Bakersfield in the south. In addition to delivering water for municipal and industrial uses and the environment, the CVP produces electric power and provides flood protection, navigation, recreation, and water quality benefits (USBR 2017).

DWR is a State agency that is responsible for managing and implementing the State Water Project (SWP). The SWP is a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants. Its main purpose is to store water and distribute it to 29 urban and agricultural water suppliers in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California (DWR 2018).

Local water districts, irrigation districts, special districts, and jurisdictions (e.g., cities and counties) manage and regulate the availability of water supplies and the treatment and delivery of water to individual projects. Depending on their location and the source of their supplies, these agencies may use groundwater, surface water through specific water entitlements, or surface water delivered through the CVP or SWP. In some remote areas not served by a water supply agency, individual developments may need to rely upon the underlying groundwater basin for their water supply. In these cases, the project would be required to secure a permit from the local or state land use authority and seek approval for development of the groundwater well(s).

b) Wastewater Collection and Treatment

The SWRCB is the state agency responsible for the regulation of wastewater discharges to surface waters and groundwater via land discharge. The SWRCB and nine RWQCBs are responsible for development and enforcement of water quality objectives and implementation plans that protect the beneficial uses of the federal and state waters. The SWRCB also administers water rights in California. The RWQCB's are responsible for issuing permits or other discharge requirements to individual wastewater dischargers and for ensuring that they are meeting the requirements of the permit through monitoring and other controls.

Wastewater collection, treatment, and discharge service for developed and metropolitan areas is typically provided by local wastewater service districts or agencies that may or may not be operated by the local jurisdiction (e.g., city or county). These agencies are required to secure treatment and discharge permits for the operation of a wastewater facility from the RWQCB. Wastewater is typically collected from a specific development and conveyed through a series of large pipelines to the treatment facility where it is treated to permitted levels and discharged to surface waters or the land.

In areas that are remote or that are not served by an individual wastewater service provider, developments would be required to install an individual septic tank or other on-site wastewater treatment system. These facilities would need to be approved by the local or state land use authority and the RWQCB.

c) Electricity and Natural Gas

The CPUC regulates investor-owned electric and natural gas companies located within California. The CPUC's Energy Division develops and administers energy policy and programs and monitors compliance with the adopted regulations. One-third of California's electricity and natural gas is provided by one of three companies: Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company (CPUC 2010).

Locally, energy service is provided by a public or private utility. New development projects would need to coordinate with the local service provider to ensure adequate capacity is available to serve the development.

d) Solid Waste Collection and Disposal

Statewide, the California Department of Resources Recycling and Recovery (CalRecycle), which is a department of the CNRA, is responsible for the regulation of the disposal and recycling of all solid waste generated in California. Cal Recycle acts as an enforcement agency in the approval and regulation of solid waste disposal and recycling facilities. Local agencies can create local enforcement agencies and, once approved by Cal Recycle, they can serve as the enforcement agency for landfills and recycling facilities with their jurisdictions.

Local agencies or private companies own and operate landfill facilities and solid waste is typically hauled to these facilities by private or public haulers. Individual projects

would need to coordinate with the local service provider and landfill to determine if adequate capacity exists to serve the project.

2.0 REGULATORY SETTING

As indicated above, since it is not possible to identify which jurisdictions may seek to use the standard within their existing or emerging emissions trading systems (or other emissions mitigation programs), nor which jurisdictions may seek to meet the standard, it is unduly speculative to include multiple jurisdictional legal and other requirements in this environmental and regulatory setting attachment. For the sake of disclosure under CEQA, this attachment includes the environmental and regulatory settings of the United States and California. At the end of the Attachment, CARB staff has included the international setting established by the United Nations Framework Convention on Climate Change (UNFCCC) for programs to reduce emissions from the deforestation and degradation of tropical forests, as established through decisions of the Conferences of the Parties to the UNFCCC.

If the California Tropical Forest Standard were to one day be proposed for incorporation into the California Cap-and-Trade Regulation, that potential future action would undergo its own regulatory amendment and environmental CEQA review process.

A. United States, State of California, and Local Regulatory Setting

1. Aesthetics

Applicable laws and regulations associated with aesthetics and scenic resources are discussed in Table A2-1.

Table A2-1
Applicable Laws and Regulations for Aesthetic Resources

Applicable Regulations	Description
Federal	
Federal Land Policy and Management Act of 1976 (FLPMA)	FLPMA is the enabling legislation establishing the Bureau of Land Management's (BLM's) responsibilities for lands under its jurisdiction. Section 102 (a) of the FLPMA states that "…the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values…" Section 103(c) identifies "scenic values" as one of the resources for which public land should be managed.

Table A2-1 Applicable Laws and Regulations for Aesthetic Resources	
Applicable Regulations	**Description**
BLM Contrast Rating System	The contrast rating system is a systematic process used by BLM to analyze visual impacts of proposed projects and activities. It is primarily intended to assist BLM personnel in the resolution of visual impact assessment.
Natural Historic Preservation Act (NHPA) of 1966	Under regulations of the NHPA, visual impacts to a listed or eligible National Register property that may diminish the integrity of the property's "setting … [or] … feeling" in a way that affects the property's eligibility for listing may result in a potentially significant adverse effect. "Examples of adverse effects … include…: Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features." (Title 36 Code of Federal Regulations CFR (CFR) Part 800.5)
National Scenic Byways Program	Title 23, Sec 162 outlines the National Scenic Byways Program. This program is used to recognize roads having outstanding scenic, historic, cultural, natural, recreational, and archaeological qualities through designation of road as: National Scenic Byways; All-American Roads; or America's Byways. Designation of the byways provides eligibility for Federal assistance for safety improvement, corridor management plans, recreation access, or other project that protect scenic, historical, recreational, cultural, natural, and archaeological resources.
State	
Ambient Air Quality Standard for Visibility-Reducing Particles	Extinction coefficient (measure of absorption of light in a medium) of 0.23 per kilometer — visibility of 10 miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.
California Streets and Highway Code, Section 260 through 263 – Scenic Highways	The State Scenic Highway Program promotes protection of designated State scenic highways through certification and adoption of local scenic corridor protection programs that conform to requirements of the California Scenic Highway Program.

Table A2-1 Applicable Laws and Regulations for Aesthetic Resources	
Applicable Regulations	**Description**
Local	
County and City Controls	Most local planning guidelines to preserve and enhance the visual quality and aesthetic resources of urban and natural areas are established in the jurisdiction's general plan. The value attributed to a visual resource generally is based on the characteristics and distinctiveness of the resource and the number of persons who view it. Vistas of undisturbed natural areas, unique or unusual features forming an important or dominant portion of a viewshed, and distant vistas offering relief from less attractive nearby features are frequently considered to be scenic resources. In some instances, a case-by-case determination of scenic value may be needed, but often there is agreement within the relevant community about which features are valued as scenic resources. In addition to federal and State designations, counties and cities have their own scenic highway designations, which are intended to preserve and enhance existing scenic resources. Criteria for designation are commonly included in the conservation/open space element of the city or county general plan.

2. Agricultural and Forest Resources

Table A2-2 below provides a general description of applicable laws and regulations that may pertain to agriculture and forest resources.

Table A2-2 Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
Federal	
Farmland Protection Policy Act (FPPA)	FPPA directs federal agencies to consider the effects of federal programs or activities on farmland, and ensure that such programs, to the extent practicable, are compatible with state, local, and private farmland protection programs and policies. The rating process established under the FPPA was developed to help assess options for land use on an evaluation of productivity weighed against commitment to urban development.
National Forest Management Act (NFMA) of 1976	NFMA is the primary statute governing the administration of national forests. The act requires the Secretary of Agriculture to assess forest lands, develop a management program based on

Table A2-2
Applicable Laws and Regulations for Agriculture and Forest Resources

Applicable Regulations	Description
	multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. Goal 4 of the U.S. Forest Service's National Strategic Plan for the National Forests states that the nation's forests and grasslands play a significant role in meeting America's need for producing and transmitting energy. Unless otherwise restricted, National Forest Service lands are available for energy exploration, development, and infrastructure (e.g., well sites, pipelines, and transmission lines). However, the emphasis on non-recreational special uses, such as utility corridors, is to authorize the special uses only when they cannot be reasonably accommodated on non-National Forest Service lands.
State	
The California Land Conservation Act, also known as the Williamson Act (Government Code Section 51200)	The DOC's Division of Land Resource Protection administers the Williamson Act program, which permits property tax adjustments for landowners who contract with a city or county to keep their land in agricultural production or approved open space uses for at least 10 years. Lands covered by Williamson Act contracts are assessed on the basis of their agricultural value instead of their potential market value under nonagricultural uses. In return for the preferential tax rate, the landowner is required to contractually agree to not develop the land for a period of at least 10 years. Williamson Act contracts are renewed annually for 10 years unless a party to the contract files for nonrenewal. The filing of a non-renewal application by a landowner ends the automatic annual extension of a contract and starts a 9-year phase-out of the contract. During the phase-out period, the land remains restricted to agricultural and open-space uses, but property taxes gradually return to levels associated with the market value of the land. At the end of the 9-year non-renewal process, the contract expires, and the owner's uses of the land are restricted only by applicable local zoning. The Williamson Act defines compatible use of contracted lands as any use determined by the county or city administering the agricultural preserve to be compatible with the agricultural, recreational, or open space use of land within the preserve and subject to contract (Government Code, Section 51202[e]). However, uses deemed compatible by a county or city government must be consistent with the principles of compatibility set forth in Government Code, Section 51238.1. Approximately 16 million acres of farmland (about 50 percent of the State's total farmland) are enrolled in the program.

Table A2-2
Applicable Laws and Regulations for Agriculture and Forest Resources

Applicable Regulations	Description
California Farmland Conservancy Program (CFCP) (Public Resources Code [PRC] Section 10200)	The program provides grant funding for agricultural conservation easements. Although the easements are always written to reflect the benefits of multiple resource values, there is a provision in the CFCP statute that prevents easements funded under the program from restricting husbandry practices. This provision could prevent restricting those practices to benefit other natural resources.
FMMP (Government Code Section 65570, PRC Section 612)	Under the FMMP, the DOC assesses the location, quality, and quantity of agricultural lands and conversion of these lands over time. Agricultural designations include the categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-Up Land, and Other Land. FMMP uses the following definitions to describe farmland types. Prime Farmland is defined by the DOC as "Land with the best combination of physical and chemical features able to sustain long term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for production of irrigated crops at some time during the past four years." Farmland of Statewide Importance is defined by the DOC as "Land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of agricultural crops. This land has minor shortcomings, such as greater slopes or less ability to store soil moisture than Prime Farmland. Land must have been used for production of irrigated crops at some time during the past four years." Unique Farmland is defined by the DOC as "Lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyard as found in some climatic zones in California."
State Lands Commission Significant Land Inventory	The State Lands Commission is responsible for managing lands owned by the State, including lands that the State has received from the federal government. These lands total more than 4 million acres and include tide and submerged lands, swamp and overflow lands, the beds of navigable waterways, and State School Lands. The State Lands Commission has a legal responsibility for, and a strong interest in, protecting the ecological and Public Trust values associated with the State's sovereign lands, including the use of these lands for habitat

Table A2-2 Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
	preservation, open space and recreation. Scoping Plan projects located within these lands would be subject to the State Lands Commission permitting process.
Local	
Open Space Element (Government Code Section 65300 et seq.)	State law requires each city and county to adopt a general plan containing at least seven mandatory elements including an open space element. The open space element identifies open space resources in the community and strategies for protection and preservation of these resources. Agricultural and forested lands are among the land use types identified as open space in general plans.
Zoning	The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different land uses and identifies which land uses (e.g., agriculture, residential, commercial, industrial) are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan, except in charter cities.

3. Air Quality

Applicable laws and regulations associated with air quality are discussed in Table A2-3.

Table 4: Applicable Laws and Regulations for Air Quality	
Regulation	**Description**
Federal	
Clean Air Act (CAA) (42 U.S. Code [USC] Section 7401 et seq.; 40 CFR (e.g., Subchapter C- Air Programs, Subpart U- Air Emission Controls))	The CAA, which was last amended in 1990, requires the U.S. EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. CAA established two types of NAAQS: primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly; and secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. U.S. EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants, which are called "criteria" pollutants. Title III of the CAA directed the U.S. EPA to promulgate national emissions standards for Hazardous Air Pollutants. The CAA also required the U.S. EPA to promulgate vehicle or fuel

Table 4: Applicable Laws and Regulations for Air Quality	
Regulation	**Description**
	standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.
SmartWay	SmartWay is an U.S. EPA program that reduces transportation-related emissions by creating incentives to improve supply chain fuel efficiency. It aims to increase the availability and market penetration of fuel efficient technologies and strategies that help freight companies save money while also reducing adverse environmental impacts.
State	
California Clean Air Act (CCAA) CCR (Titles 13 and 17)	CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA. The CCAA, which was adopted in 1988, required CARB to establish California Ambient Air Quality Standards.
Waste Heat and Carbon Emissions Reduction Act	This Act is designed to encourage the development of new combined heat and power (CHP) systems in California with a generating capacity of not more than 20 megawatts. Section 2843 of the Act provides that the Energy Commission's guidelines require that CHP systems: be designed to reduce waste energy; have a minimum efficiency of 60 percent; have NO_X emissions of no more than 0.07 pounds per megawatt-hour; be sized to meet the eligible customer generation thermal load; operate continuously in a manner that meets the expected thermal load and optimizes the efficient use of waste heat; be cost effective, technologically feasible, and environmentally beneficial.
Other Applicable State-Level Regulations	This includes all other applicable regulations at the State level for portions of the project area that are outside of California (e.g., Toxic Air Contaminant Identification and Control Act [AB 1807] Tanner, Ch. 1047, Statutes of 1983 and Air Toxics "Hot Spots" Information and Assessment [AB 2588], Connelly, Ch.1252, Stats. of 1987.).
Local	
Air Districts	Air Districts have primary responsibility for preparation, adoption, and implementation of mobile, stationary, and area emission control measures and for the preparation of the SIP and any amendments.

4. Biological Resources

Applicable laws and regulations associated with biological resources are discussed in Table A2-4.

Table A2-4
Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
Federal	
Federal Endangered Species Act (ESA) (16 USC Section 1531 et seq.)	The ESA designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Two sections of the ESA address take of threatened and endangered species. Section 7 covers actions that would result in take of a federally-listed species and have a federal discretionary action. Section 10 regulates actions that would result in take of threatened or endangered species and a non-federal agency is the lead agency for the action. Section 10 of the ESA requires preparation of a habitat conservation plan (HCP). More than 430 HCPs have been approved nationwide (U.S. Fish and Wildlife Service [USFWS] 2005).
Migratory Bird Treaty Act (16 USC Section 703 et seq.)	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird) as designated in the Migratory Bird Treaty Act.
Clean Water Act (CWA) (33 USC Section 1251 et seq.)	The CWA requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into Waters of the U.S., including wetlands. Section 401 requires a permit from a RWQCB for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request State certification that the proposed activity would not violate State and federal water quality standards.
Rivers and Harbors Act of 1899	The Rivers and Harbors Act requires a permit or letter of permission from USACE prior to any work being completed within navigable waters.
U.S. EPA Section 404 (b)(1) Guidelines	Section 404 requires USACE to analyze alternatives in a sequential approach such that USACE must first consider avoidance and minimization of impacts to the extent practicable to determine whether a proposed discharge can be authorized.

Table A2-4
Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
California Desert Conservation Area (CDCA) Plan	The CDCA Plan comprises one of two national conservation areas established by Congress in 1976. The FLPMA outlines how BLM would manage public lands. Congress specifically provided guidance for the management of the CDCA Plan and directed the development of the 1980 CDCA Plan.
Federal Noxious Weed Act of 1974 (P.L. 93-629) (7 U.S.C. 2801 et seq.; 88 Stat. 2148)	Establishes a federal program to control the spread of noxious weeds. Authority is given to the Secretary of Agriculture to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit.
EO 13112, "Invasive Species," February 3, 1999	EO 13112 mandates that federal agencies take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.
EO 11988, "Floodplain Management," May 24, 1977	EO 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.
EO 11990, "Protection of Wetlands," May 24, 1977	EO 11990 requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
EO 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," January 10, 2001	EO 13186 requires that each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations develop and implement a Memorandum of Understanding (MOU) with USFWS that shall promote the conservation of migratory bird populations.
Bald and Golden Eagle Protection Act (16 USC Section 668 et seq.)	The Bald and Golden Eagle Protection Act declares it is illegal to take, possess, sell, purchase, barter, offer to sell or purchase or barter, transport, export or import a bald or golden eagle, alive or dead, or any part, nest or egg of these eagles unless authorized. Active nest sites are also protected from disturbance during the breeding season.
BLM Manual 6840 — Special Status Species Management	This policy establishes special status species policy on BLM land for plant and animal species and the habitats on which they depend. The policy refers to species designated by the BLM State Director as sensitive.
Listed Species Recovery Plans and Ecosystem Management Strategies	These plans and strategies provide guidance for the conservation and management of sufficient habitat to maintain viable populations of listed species and

Table A2-4 Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
	ecosystems. Relevant examples include, but are not limited to, the Desert Tortoise Recovery Plan, Flat-tailed Horned Lizard Rangewide Management Strategy; Amargosa Vole Recovery Plan; and Recovery Plan for Upland Species of the San Joaquin Valley.
State	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species.
Natural Community Conservation Planning (NCCP) Act 1991	The primary objective of the NCCP Act is to conserve natural communities at the ecosystem level while accommodating compatible land use. An NCCP identifies and provides for the regional or area-wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. There are currently 23 NCCPs that have been adopted or are in progress in California (CDFW 2017).
Porter-Cologne Water Quality Control Act	The Porter-Cologne Water Quality Control Act requires that each of the nine RWQCBs prepare and periodically update basin plans for water quality control. Each basin plan sets forth water quality standards for surface water and groundwater and actions to control nonpoint and point sources of pollution to achieve and maintain these standards.
Wetlands Preservation (Keene-Nejedly California Wetlands Preservation Act) (PRC, Section 5810 et seq.)	California has established a successful program of regional, cooperative efforts to protect, acquire, restore, preserve, and manage wetlands. These programs include, but are not limited to, the Central Valley Habitat Joint Venture, the San Francisco Bay Joint Venture, the Southern California Wetlands Recovery Project, and the Inter-Mountain West Joint Venture.
California Wilderness Preservation System (PRC, Section 5093.30 et seq.)	The California Wilderness Act establishes a California wilderness preservation system that consists of State-owned areas to be administered for the use and enjoyment of the people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, provide for the protection of such areas, preserve their wilderness character, and provide for the gathering and dissemination of information regarding their use and enjoyment as wilderness.

Table A2-4
Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	This policy designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
Protection of Birds and Nests (Fish and Game Code section 3503 and 3503.5)	These policies protect California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Raptors (e.g., hawks and owls) are specifically protected.
Migratory Birds (Fish and Game Code section 3513)	This policy protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.
Fur-bearing Mammals (Fish and Game Code sections 4000 and 4002)	This policy lists fur-bearing mammals which require a permit for take.
Fully Protected Species (Fish and Game Code Sections 3511,4700, 5050, and 5515)	These policies identify several amphibian, reptile, fish, bird, and mammal species that are Fully Protected. The CDFW cannot issue a take permit for these species, except for take related to scientific research.
CEQA Guidelines 15380	CEQA defines rare species more broadly than the definitions for species listed under the state and federal Endangered Species Acts. Under section 15830, species not protected through state or federal listing but nonetheless demonstrable as "endangered" or "rare" under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFW's Special Animals List.
Oak Woodlands (California PRC Section 21083.4)	This policy requires counties to determine if a project within their jurisdiction may result in conversion of oak woodlands that would have a significant adverse effect on the environment. If the lead agency determines that a project would result in a significant adverse effect on oak woodlands, mitigation measures to reduce the significant adverse effect of converting oak woodlands to other land uses are required.
Lake and Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	This policy regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to

Table A2-4 Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
	waterways are also reviewed and regulated during the permitting process.
California Desert Native Plants Act of 1981 (Food and Agricultural Code section 80001 et seq. and California Fish and Game Code sections 1925-1926)	The California Desert Native Plants Act protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.
Food and Agriculture Code, Section 403	The CDFA is designated to prevent the introduction and spread of injurious insect or animal pests, plant diseases, and noxious weeds.
Noxious Weeds (Title 3, California Code of Regulations, Section 4500)	List of plant species that are considered noxious weeds.
Local	
Various City and County General Plans	General plans typically designate areas for land uses, guiding where new growth and development should occur while providing a plan for the comprehensive and long-range management, preservation, and conservation of and natural resources and open-space lands.
Various Local Ordinances	Local ordinances provide regulations for proposed projects for activities such as grading plans, erosion control, tree removal, protection of sensitive biological resources and open space.

5. Cultural Resources

Applicable laws and regulations associated with cultural resources are discussed in Table A2-5.

Table A2-5 Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
Federal	
NHPA	The NHPA requires federal agencies to consider the preservation of historic and prehistoric resources. The Act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places (NRHP), and it

Table A2-5
Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
	establishes an Advisory Council on Historic Preservation (ACHP) as an independent federal entity. Section 106 of the Act requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on the undertaking prior to licensing or approving the expenditure of funds on any undertaking that may affect properties listed, or eligible for listing, in the NRHP.
National Environmental Policy Act (NEPA) of 1969	The NEPA requires federal agencies to foster environmental quality and preservation. Section 101(b)(4) declares that one objective of the national environmental policy is to "preserve important historic, cultural, and natural aspects of our national heritage." For major federal actions significantly affecting environmental quality, federal agencies must prepare, and make available for public comment, an environmental impact statement.
National Archaeological Resources Protection Act of 1979 (NRPA)(16 USC 470aa-470II)	The NRPA requires a permit for any excavation or removal of archaeological resources from public lands or Indian lands. The statute provides both civil and criminal penalties for violation of permit requirements and for excavation or removal of protected resources without a permit.
Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (PL 101–601)	The NAGPRA vests ownership or control of certain human remains and cultural items excavated or discovered on federal or tribal lands, in designated Native American tribes, organizations, or groups. The Act further requires notification of the appropriate Secretary or other head of any federal agency upon the discovery of Native American cultural items on federal or tribal lands; proscribes trafficking in Native American human remains and cultural items; requires federal agencies and museums to compile an inventory of Native American human remains and associated funerary objects, and to notify affected Indian tribes of this inventory; and provides for the repatriation of Native American human remains and specified objects possessed or controlled by federal agencies or museums.
Advisory Council Regulation, Protection of Historic Properties (SHPO) (36 CFR 800)	This regulation establishes procedures for compliance with Section 106 of the NHPA. These regulations define the Criteria of Adverse Effect, define the role of SHPO in the Section 106 review process, set forth documentation requirements, and describe procedures to be followed if significant historic properties are discovered during implementation of an undertaking. Prehistoric and historic resources deemed significant (i.e., eligible for listing in the NRHP, per 36 CFR 60.4)

Table A2-5
Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
	must be considered in project planning and construction. The responsible federal agency must submit any proposed undertaking that may affect NRHP-eligible properties to the SHPO for review and comment prior to project approval.
NRHP (36 CFR 60)	These regulations set forth procedures for nominating properties to the NRHP, and present the criteria to be applied in evaluating the eligibility of historic and prehistoric resources for listing in the NRHP.
Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (Federal Register [FR] 190:44716–44742)	Non-regulatory technical advice about the identification, evaluation, documentation, study, and other treatment of cultural resources. Notable in these Guidelines are the "Standards for Archaeological Documentation" (p. 44734) and "Professional Qualifications Standards for Archaeology" (pp. 44740–44741).
American Indian Religious Freedom Act of 1978	The American Indian Religious Freedom Act pledges to protect and preserve the traditional religious rights of American Indians, Aleuts, Eskimos, and Native Hawaiians. Before the act was passed, certain federal laws interfered with the traditional religious practices of many American Indians. The Act establishes a national policy that traditional Native American practices and beliefs, sites (and right of access to those sites), and the use of sacred objects shall be protected and preserved.
Department of Transportation Act of 1966, Section 4(f)	Section 4(f) of the Act requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the Federal Housing Administration, FTA, and Federal Aviation Administration (FAA) that involve the use—or interference with use—of several types of land: public park lands, recreation areas, and publicly or privately owned historic properties of federal, state, or local significance. The Section 4(f) evaluation must be sufficiently detailed to permit the U.S. Secretary of Transportation to determine that there is no feasible and prudent alternative to the use of such land, in which case the project must include all possible planning to minimize harm to any park, recreation, wildlife and waterfowl refuge, or historic site that would result from the use of such lands. If there is a feasible and prudent alternative, a proposed project using Section 4(f) lands cannot be approved by the Secretary. Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments.

Table A2-5
Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
State	
California Health and Safety Code Section and California PRC, Section	Disturbance of human remains without the authority of law is a felony (California Health and Safety Code, Section 7052). According to State law (California Health and Safety Code, Section 7050.5, California PRC, Section 5097.98), if human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until 1) the coroner of the county has been informed and has determined that no investigation of the cause of death is required; 2) and if the remains are of Native American origin, and if the descendants from the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of with appropriate dignity the human remains and any associated grave goods as provided in PRC Section 5097.98; or the Native American Heritage Commission was unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified by the Commission. According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the Native American Heritage Commission, who has jurisdiction over Native American remains (California Health and Safety Code, 7052.5c; PRC, Section 5097.98).
CEQA Guidelines Section 15380	CEQA requires that public agencies financing or approving public or private projects must assess the effects of the project on cultural resources. Furthermore, it requires that, if a project results in significant impacts on important cultural resources, alternative plans or mitigation measures must be considered; only significant cultural resources, however, need to be addressed. Thus, prior to the development of mitigation measures, the importance of cultural resources must be determined.

Table A2-5 Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
AB 52 (Statutes of 2014)	AB 52 (Gatto, Chapter 532, Statutes of 2014) recognizes that tribal sovereignty and the unique relationship of California local governments and public agencies with California Native American tribal governments, while respecting the interests and roles of project proponents. This requires specific consultation processes for project review and approval.
Local	
City/County General Plans	Policies, goals, and implementation measures in county or city general plans may contain measures applicable to cultural and paleontological resources. In addition to the enactment of local and regional preservation ordinances, CEQA requires that resources included in local registers be considered (pursuant to section 5020.1(k) of the PRC). Therefore, local county and municipal policies, procedures, and zoning ordinances must be considered in the context of project-specific undertakings. Cultural resources are generally discussed in either the open space element or the conservation element of the general plan. Many local municipalities include cultural resources preservation elements in their general plans that include some mechanism pertaining to cultural resources in those communities. In general, the sections pertaining to archaeological and historical properties are put in place to afford the cultural resources a measure of local protection. The policies outlined in the individual general plans should be consulted prior to any undertaking or project.
Cooperative Agreements Among Agencies	Cooperative agreements among land managing agencies (BLM, National Park Service [NPS], U.S. Forest Services, California State Parks, Bureau of Indian Affairs, Department of Defense, to name a few) the SHPO and ACHP may exist and will need to be complied with on specific projects. In addition, certain agencies have existing Programmatic Agreements requiring permits (CPUC, BLM) to complete archaeological investigations and employ the Secretary of Interior's Professional Qualification Standards and Guidelines (36 CFR 61).

6. Energy Demand

Applicable laws and regulations associated with energy resources are discussed in Table A2-6.

Table A2-6 Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
Federal	
Energy Policy and Conservation Act	The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the United States would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States Pursuant to the Act, the National Highway Traffic and Safety Administration (NHTSA), which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards. From 1986 to 2012, fuel economy standards for passenger vehicles remained nearly stagnant at between 20.7 miles per gallon (mpg) for trucks and 27.5 mpg for light-duty cars. In 2010, U.S. EPA adopted new passenger vehicle standards starting with the 2012 model year that incorporates greenhouse gas (GHG) emissions standards on a vehicle-footprint basis and to accommodate the efficiencies of electric and other alternatively fueled vehicles. Additional standards for model years through 2025 were adopted in 2012. Translating the GHG standards to mpg equivalents, the projected fuel economy standard for new passenger cars and light trucks combined would increase from 30.1 to 54.5 between 2012 and 2025 model years. Until 2010, heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) were not subject to fuel economy standards. In 2011, NHTSA and U.S. EPA released fuel economy standards for medium- and heavy-duty vehicles (over 8,500 pounds gross vehicle weight) for 2014 through 2018 model years. Fuel economy standards for these vehicles vary by vehicle profession and include explicit mpg goals as well as percent reduction targets. In 2016, NHTSA and U.S. EPA adopted new standards for medium- and heavy-duty vehicles for 2018 through 2027 that would achieve GHG emissions reductions of approximately 1.1 billion metric tons (U.S. EPA 2016). Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States The Corporate Average Fuel Economy (CAFE) program, administered by the U.S. EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test

Table A2-6
Applicable Laws and Regulations for Energy Resources

Regulation	Description
	results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.
Energy Policy Act (EPAct) of 1992	EPAct was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.
Energy Policy Act of 2005	The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.
State	
Warren-Alquist State Energy Resources Conservation and Development Act of 1974	The Warren-Alquist Act is the legislation that created and gives statutory authority to the CEC (formally called the State Energy Resources Conservation and Development Commission).
Integrated Energy Policy Reports (Senate Bill [SB] 1389)	SB 1389 (Bowen, Chapter 568, Statutes of 2002) requires CEC to prepare a biennial integrated energy policy report that contains an assessment of major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (PRC Section 25301(a)). CEC prepares these assessments and associated policy recommendations every 2 years, with updates in alternate years, as part of the Integrated Energy Policy Report (IEPR). Preparation of the IEPR involves close collaboration with federal, state, and local agencies and a wide variety of

Table A2-6
Applicable Laws and Regulations for Energy Resources

Regulation	Description
	stakeholders in an extensive public process to identify critical energy issues and develop strategies to address those issues (CEC 2012).
California Long-Term Energy Efficiency Strategic Plan	On September 18, 2008, the CPUC adopted California's first Long Term Energy Efficiency Strategic Plan, presenting a single roadmap to achieve maximum energy savings across all major groups and sectors in California. This comprehensive plan for 2009 to 2020 is the State's first integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holds energy efficiency to its role as the highest priority resource in meeting California's energy needs. The plan was updated in January 2011 to include a lighting chapter.
California Building Energy Efficiency Standards (24 CCR Part 6)	California's Building Energy Efficiency Standards (Title 24, Part 6 of the CCR) serve to conserve electricity and natural gas in new building construction and are administered by CEC. Local governments enforce the standards through local building permitting and inspections. CEC updates these standards on a triennial basis. The 2016 Building Energy Efficiency Standards, which took effect on January 1, 2017, are approximately 28 percent more efficient than previous standards (2013) for residential land uses and 5 percent more efficient for nonresidential land uses. On May 9, 2018, CEC adopted the 2019 Building Energy Efficiency Standards which contain new requirements to further improve the energy efficiency of new buildings and will go into effect on January 1, 2020.
Comprehensive Energy Efficiency Plan for Existing Buildings (AB 758)	AB 758 (Skinner, Chapter 470, Statutes 2009) requires the CEC, in collaboration with the CPUC and stakeholders, to develop a comprehensive program to achieve greater energy efficiency in the State's existing buildings.
California Renewable Energy Portfolio Standard (RPS) (SB X1-2)	In 2011, Governor Brown signed SB X1-2, which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 33 percent of their electricity supply (portfolio) from renewable sources by 2020. The CPUC and the CEC jointly implement the Statewide RPS program through rulemakings and monitoring the activities of electric energy utilities in the state.
California Qualifying Facility and Combined Heat and Power Program Settlement	In December 2010, the CPUC approved California's Qualifying Facility and Combined Heat and Power Program Settlement, which established a CHP framework for the State's investor-owned utilities. The settlement established a near-term target of 3,000 megawatts of CHP for entities under the jurisdiction of the CPUC, although this target includes not just

Table A2-6
Applicable Laws and Regulations for Energy Resources

Regulation	Description
	new CHP, but capacity from renewal of contracts due to expire in the next 3 years. The CPUC has also adopted a settlement agreement that includes reforms to the Rule 21 interconnection process to provide a clear, predictable path to interconnection of distributed generation while maintaining the safety and reliability of the grid (CEC 2012).
California Strategy to Reduce Petroleum Dependence (AB 2076)	AB 2076 (Chapter 936, Statutes of 2000) requires the CEC and the CARB to develop and submit to the Legislature a strategy to reduce petroleum dependence in California. The statute requires the strategy to include goals for reducing the rate of growth in the demand for petroleum fuels. In addition, the strategy is required to include recommendations to increase transportation energy efficiency as well as the use of non-petroleum fuels and advanced transportation technologies including alternative fuel vehicles, hybrid vehicles, and high-fuel efficiency vehicles. The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and CARB in 2003. The strategy recommends that California reduce inroad gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles; and increase the use of nonpetroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.
Alternative and Renewable Fuel and Vehicle Technology Program (AB 118)	AB 118 (Statues of 2007) created the CEC's Alternative and Renewable Fuel and Vehicle Technology Program. The statute, subsequently amended by AB 109 (Statues of 2008), authorizes the CEC to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the State's climate change policies.
Alternative Fuels Plan (AB 1007)	AB 1007 requires the CEC to prepare a state plan to increase the use of alternative fuels in California. Any environmental document prepared for a strategic growth plan, regional blueprint general plan metropolitan planning or transportation plan should include an evaluation of alternative fuels for emissions or criteria pollutants, TACs, GHGs, water pollutants, and other harmful substances, and their impacts on petroleum consumption, and set goals for increased alternative fuel use in the state for the next decades, and recommend policies to ensure the alternative fuel goals are attained, including standards on transportation fuels and vehicle and policy

Table A2-6 Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
	mechanisms to ensure vehicles operating on alternative fuels use those fuels to the maximum extent feasible.
Bioenergy Action Plan (EO S-06-06)	EO #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. This EO establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The EO also calls for the state to meet a target for use of biomass electricity.
Governor's Low Carbon Fuel Standard (LCFS) (EO S-01-07)	EO #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of the LCFS. The EO requires LCFS to be incorporated into the State Alternative Fuels Plan required by AB 1007 and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32. In January 2010, the Office of Administrative Law approved the LCFS regulation. CARB is currently amending the existing LCFS regulation and is expected to approve the amendments in 2018.
Clean Energy and Pollution Reduction Act of 2015 (SB 350)	The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources to be increased to 50 percent by December 31, 2030. This act also requires doubling of the energy efficiency savings in electricity and natural gas for retail customers through energy efficiency and conservation by December 31, 2030.
Local	
City/County General Plans	Many cities and counties have general plan elements and policies that specifically address energy use and conservation. Those energy conservation measures outlined in the various county and city general plans contain goals, objectives, and policies aimed at reducing energy consumption. Proponents of specific projects would be required to consult the applicable general plans and design the projects consistent with the guidelines of those general plans in which the projects are located.

7. Geology and Soils

Applicable laws and regulations associated with geology and soils are discussed in Table A2-7.

Table A2-7
Applicable Laws and Regulations for Geology, Soils, and Mineral Resources

Regulation	Description
Federal	
SDWA - Federal Underground Injection Control Class VI Program for Carbon Dioxide Geology Sequestration Wells	Under the SDWA, the Federal Underground Injection Control (UIC) Class VI Program for Carbon Dioxide Geologic Sequestration Wells requires states and owners or operators to submit all permit applications to the appropriate U.S. EPA Region for a Class VI permit to be issued. These requirements, also known as the Class VI rule, are designed to protect underground sources of drinking water. The Class VI rule builds on existing UIC Program requirements, with extensive tailored requirements that address carbon dioxide injection for long-term storage to ensure that wells used for geologic sequestration are appropriately sited, constructed, tested, monitored, funded, and closed. The rule also affords owners or operators injection depth flexibility to address injection in various geologic settings in the U.S. in which geologic sequestration may occur, including very deep formations and oil and gas fields that are transitioned for use as carbon dioxide storage sites.
SDWA - Federal Underground Injection Control Class II Program for Oil and Gas Related Injection Wells	The Class II Program for Oil and Gas Related Injection Wells requires states to meet EPA's minimum requirements for UIC programs including strict construction and conversion standards and regular testing and inspection. Enhanced oil and gas recovery wells may either be issued permits or be authorized by rule. Disposal wells are issued permits.
CWA (40 CFR 112)	The CWA was enacted to restore and maintain the chemical, physical, and biological integrity of the nation's waters by regulating point and nonpoint pollution sources, helping publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. This includes the creation of a system that requires states to establish discharge standards specific to water bodies (National Pollution Discharge Elimination System [NPDES]), which regulates storm water discharge from construction sites through the implementation of Storm Water Pollution Prevention Plans (SWPPPs). In California, the state's NPDES permit program is implemented and administered by the local RWQCBs.

Table A2-7 Applicable Laws and Regulations for Geology, Soils, and Mineral Resources	
Regulation	**Description**
Earthquake Hazards Reduction Act and National Earthquake Hazards Reduction Program Act	This Act established the National Earthquake Hazards Reduction Program to reduce the risks to life and property from future earthquakes. This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act by refining the description of agency responsibilities, program goals and objectives.
Mining and Mineral Policy Act	The Mining and Mineral Act of 1970 declared that the Federal Government policy is to encourage private enterprise in the development of a sound and stable domestic mineral industry, domestic mineral deposits, minerals research, and methods for reclamation in the minerals industry.
State	
Seismic Hazards Mapping Act (PRC Section 2690 et seq.)	The Seismic Hazards Mapping Act of 1990 (PRC, Chapter 7.8, Division 2) directs the DOC Division of Mines and Geology (now called CGS) to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. These include areas identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.
Alquist-Priolo Earthquake Fault Zoning Act (PRC Section 2621 et seq.)	California's Alquist-Priolo Act (PRC Section 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (Earthquake Fault Zones). It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to Earthquake Fault Zones. Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for the purposes of the act as within the last 11,000

Table A2-7
Applicable Laws and Regulations for Geology, Soils, and Mineral Resources

Regulation	Description
	years). A fault is considered well-defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment.
California Division of Oil, Gas, and Geothermal Resources (DOGGR), PRC Section 3106.	PRC Section 3106 mandates the supervision of drilling, operation, maintenance, and abandonment of oil wells for the purpose of preventing: damage to life, health, property, and natural resources; damage to underground and surface waters suitable for irrigation or domestic use; loss of oil, gas, or reservoir energy; and damage to oil and gas deposits by infiltrating water and other causes. In addition, the DOGGR regulates drilling, production, injection, and gas storage operations in accordance with 14 CCR Chapter 4, Subchapter 1.
Landslide Hazard Identification Program, PRC Section 2687(a)	The Landslide Hazard Identification Program requires the State Geologist to prepare maps of landslide hazards within urbanizing areas. According to PRC Section 2687(a), public agencies are encouraged to use these maps for land use planning and for decisions regarding building, grading, and development permits.
California Building Standards Code (CBSC) (24 CCR)	California's minimum standards for structural design and construction are given in the CBSC (24 CCR). The CBSC is based on the Uniform Building Code (International Code Council 1997), which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed or more stringent regulations. The CBSC provides standards for various aspects of construction, including (i.e., not limited to) excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, proponents of specific projects would be required to comply with all provisions of the CBSC for certain aspects of design and construction.
Surface Mining and Reclamation Act (SMARA) (PRC Section 2710 et seq.)	The intent of the SMARA of 1975 was to promote production and conservation of mineral resources, minimize environmental effects of mining, and to assure that mined lands will be reclaimed to conditions suitable for alternative uses. An important part of the SMARA legislation requires the State Geologist to classify land according to the presence or absence of significant mineral deposits. Local jurisdictions are given the authority to permit or restrict mining operations, adhering to the

Table A2-7 Applicable Laws and Regulations for Geology, Soils, and Mineral Resources	
Regulation	**Description**
	SMARA legislation. Classification of an area using MRZs to designate lands that contain mineral deposits are designed to protect mineral deposits from encroaching urbanization and land uses that are incompatible with mining. The MRZ classifications reflect varying degrees of mineral significance, determined by available knowledge of the presence or absence of mineral deposits as well as the economic potential of the deposits.
California PRC Sections 2762-2763	PRC Section 2762 states that the general plan must establish mineral resource management policies if the State Geologist has identified resources of statewide or regional significance within the city or county. PRC Section 2763 requires that city and county land use decisions affecting areas with minerals of regional or statewide significance be consistent with mineral resource management policies in the general plan, including protection of known mineral resources.
Local	
Geotechnical Investigation	Local jurisdictions typically regulate construction activities through a process that may require the preparation of a site-specific geotechnical investigation. The purpose of a site-specific geotechnical investigation is to provide a geologic basis for the development of appropriate construction design. Geotechnical investigations typically assess bedrock and Quaternary geology, geologic structure, soils, and the previous history of excavation and fill placement. Proponents of specific projects that require design of earthworks and foundations for proposed structures will need to prepare geotechnical investigations on the physical properties of soil and rock at the site prior to project design.
Local Grading and Erosion Control Ordinances	Many counties and cities have grading and erosion control ordinances. These ordinances are intended to control erosion and sedimentation caused by construction activities. A grading permit is typically required for construction-related projects. As part of the permit, project applicants usually must submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading permit include a description of Best Management Practices similar to those contained in a SWPPP.
City/County General Plans	Most city and county general plans include an element that covers geology, soil, and mineral resources within that jurisdiction.

8. Greenhouse Gases

Applicable laws and regulations specific to the reduction of GHG emissions are listed in Table A2-8 below. It should be noted that other laws and regulations described under Energy Demand in this Environmental Setting would also reduce GHG emissions.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Federal	
Mandatory Greenhouse Gas Reporting Rule	On September 22, 2009, U.S. EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States In general, this national reporting requirement will provide U.S. EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85 percent of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.
National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks	Since the 2012 model year, U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) have regulated greenhouse gas emissions and fuel economy from new light-duty motor vehicles (passenger cars) in a consistent program that would significantly reduce expected emissions of greenhouse gases, criteria and toxic air contaminants, and fuel consumption. See 40 C.F.R. § 86.1818-12. Current federal emission regulations apply through the 2025 model year, and federal fuel economy standards through the 2021 model year. While California has its own greenhouse gas emission standards for these vehicles, it accepts compliance with the federal emissions standards, resulting in a unified national program through model year 2025. See Cal. Code Regs., tit. 13, § 1961.3. However, U.S. EPA and NHTSA have proposed to significantly relax their standards to cease further improvements after model year 2020. 83 Fed.Reg. 42,985 (Aug. 24, 2018). California opposes this proposal and is taking steps to preserve and enforce its existing emissions standards. See CARB, Notice of Public Hearing to Consider Proposed Amendments to the Low-Emission Vehicle III Greenhouse Gas Emission Regulation, Aug. 6, 2018, available at: https://www.arb.ca.gov/regact/2018/leviii2018/leviiinotice.pdf.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Endangerment and Cause or Contribute Findings	On December 7, 2009, U.S. EPA adopted its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding). The Endangerment Finding is based on Section 202(a) of the CAA, which states that the Administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class of classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The rule addresses Section 202(a) in two distinct findings. The first addresses whether or not the concentrations of the six key GHGs (i.e., CO_2, methane, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether or not the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and therefore the threat of climate change. The Administrator found that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea level rise, and higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations. The Administrator also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. U.S EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHGs fit within the CAA definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but rather allow U.S. EPA to finalize the GHG standards proposed earlier in 2009 for new light-duty vehicles as part of the joint rulemaking with U.S. DOT.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Significant New Alternatives Policy (SNAP)	U.S. EPA's SNAP program provide an evolving list of alternatives (i.e., chemicals that may replace one that is currently in use for a specific purpose). U.S. EPA makes decisions informed by the overall understanding of the environmental and human health impacts as well as the current knowledge regarding available substitutes. Where U.S. EPA is determining whether to add a new substitute to the list, U.S. EPA compares the risk posed by the new substitute to the risks posed by other alternatives on the list and determines whether that specific new substitutes poses more risk than already-listed alternatives for the same use. Section 612 of the Clean Air Act provides that U.S. EPA must prohibit the use of a substitute where it has determined that there are other available substitutes that pose less overall risk to human health and the environment.
State	
EO B-30-15	EO B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030. To accomplish this goal, directs state agencies to take measures consistent with their existing authority to reduce greenhouse gas emissions. In addition, the California Air Resources Board will initiate a public process in the summer of 2015 and work closely with other state agencies to update the State's climate change Scoping Plan. The updated Scoping Plan will provide a framework for achieving the 2030 target and will be completed and adopted by the Air Resources Board in 2016. Concurrent planning efforts related to energy efficiency in existing buildings (AB 758), short-lived climate pollutants, sustainable freight, Greenhouse Gas Reduction Fund Investments, forest health, and others will be coordinated with, and feed into, the updated Scoping Plan.
EO S-3-05	EO S-3-05, which was signed by former Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established statewide GHG emission reduction targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The EO directed the Secretary of CalEPA to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	Secretary will also submit biannual reports to the governor and State legislature describing: progress made toward reaching the emission targets; impacts of global warming on California's resources; and mitigation and adaptation plans to combat these impacts. To comply with the EO, the Secretary of the CalEPA created the Climate Action Team (CAT) made up of members from various State agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through State incentive and regulatory programs.
SB 32 and AB 197 (Statutes of 2016)	Governor Brown signed SB 32 (Pavley, Chapter 249, Statutes of 2016) and AB 197 (Garcia, Chapter 250, Statutes of 2016) on September 8, 2016. SB 32 establishes a statewide target of reducing statewide GHG emissions to 40 percent below 1990 levels by 2030. This is the same target contained in EO B-30-15 (2015). SB 32 authorizes CARB to adopt regulations to achieve the maximum technologically-feasible and cost-effective GHG reductions. AB 197 creates a legislative committee to oversee CARB and requires CARB to take specific actions when adopting plans and regulations pursuant to SB 32 related to disadvantaged communities, identification of specific information regarding reduction measures, and information regarding existing greenhouse gases at the local level.
Clean Energy and Pollution Reduction Act of 2015 (SB 350, Statues of 2015)	The Clean Energy and Pollution Reduction Act of 2015 (De León, Chapter 547, Statutes of 2015) requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50percent by December 31, 2030. This act also requires doubling of the energy efficiency savings in electricity and natural gas for retail customers, through energy efficiency and conservation, by December 31, 2030.
SB 605, SLCPs (Statutes of 2014)	SB 605 directs CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state through the following actions: (1) Complete an inventory of sources and emissions of short-lived climate pollutants in the state based on available data. (2) Identify research needs to address any data gaps. (3) Identify existing and potential new control measures to reduce emissions.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	(4) Prioritize the development of new measures for short-lived climate pollutants that offer cobenefits by improving water quality or reducing other air pollutants that impact community health and benefit disadvantaged communities, as identified pursuant to Section 39711. (5) Coordinate with other state agencies and districts to develop measures identified as part of the comprehensive strategy.
AB 32, the California Global Warming Solutions Act, Statutes of 2006	In September 2006, former Governor Arnold Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from substantial stationary and mobile source categories. AB 32 required CARB to produce a Scoping Plan by January 1, 2009, and then at least every 5 years afterwards, that details how the State will meet its GHG reduction targets. AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the State achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.
AB 1493, Statutes of 2002	In September 2004, CARB approved regulations to reduce GHG emissions from new motor vehicles. The Board took this action pursuant to Chapter 200, Statutes of 2002 (AB 1493, Pavley) which directed the Board to adopt regulations that achieve the maximum feasible and cost-effective reduction in greenhouse gas emissions from motor vehicles. The regulations, which took effect in 2006 following an opportunity for legislative review, apply to new passenger vehicles and light duty trucks beginning with the 2009 model year.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
EO S-1-07	EO S-1-07, which was signed by former Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at over 40 percent of statewide emissions. It establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10 percent by 2020. This order also directed CARB to determine if this LCFS could be adopted as a discrete early action measure after meeting the mandates in AB 32. CARB adopted the LCFS on April 23, 2009.
SB 1368, Statutes of 2006	SB 1368 is the companion bill of AB 32 and was signed by former Governor Schwarzenegger in September 2006. SB 1368 requires the CPUC to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The CEC must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.
SB 1078, Statutes of 2002, SB 107, Statutes of 2006, and SBx1 2	SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In 2010, SBx1 2 was chaptered, which expanded the State's Renewable Portfolio Standard to 33 percent renewable power by 2020.
SB 97, Statutes of 2007	As directed by SB 97, the Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.
SB 375, Statutes of 2008	SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	Transportation Plan (RTP). CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012. This bill also extends the minimum time period for the Regional Housing Needs Allocation cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would incent qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."
EO S-13-08	Sea level rise is a foreseeable indirect environmental impact associated with climate change, largely attributable to thermal expansion of the oceans and melting polar ice. As discussed above in the environmental setting (subheading "Adaptation to Climate Change"), sea level rise presents impacts to California associated with coastal erosion, water supply, water quality, saline-sensitive species and habitat, land use compatibility, and flooding. Former Governor Arnold Schwarzenegger signed EO S-13-08 on November 14, 2008. This EO directed the California Natural Resources Agency (CNRA) to develop the 2009 California Climate Adaptation Strategy (CNRA 2009), which summarizes the best known science on climate change impacts in seven distinct sectors—public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forest resources, and transportation and energy infrastructure—and provides recommendations on how to manage against those threats. This EO also directed OPR, in cooperation with the CNRA, to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009, which is also provided in the 2009 California Climate Adaptation Strategy (CNRA 2009) and OPR continues to further refine land use planning guidance related to climate change impacts.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	EO S-13-08 also directed CNRA to convene an independent panel to complete the first California Sea Level Rise Assessment Report. This report is to be completed no later than December 1, 2010. The report is intended to provide information on the following: Relative sea level rise projections specific to California, taking into account issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates. The range of uncertainty in selected sea level rise projections; A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems; and Discussion of future research needs regarding sea level rise for California.
CARB's Landfill Methane Control Measure	The regulation requires owners and operators of certain uncontrolled municipal solid waste landfills to install gas collection and control systems and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation allows local air districts to voluntarily enter into agreements with CARB to implement and enforce the regulation and to assess fees to cover costs. Some local air districts have also adopted rules to implement federal standards for the installation of gas collection and control systems.
AB 341 (Chesbro, Chapter 476, Statutes of 2011)	AB 341 (Chesbro, Chapter 476, Statutes of 2011 established a State target to reduce by 75 percent the amount of solid waste sent to landfills by 2020 through recycling, composting, and source reduction practices.
AB 1826 (Chesbro, Chapter 727, Statutes of 2014)	AB 1826 (Chesbro, Chapter 727, Statutes of 2014) requires businesses generating specified amounts of organic wastes to begin arranging for the recycling and diversion of those wastes from landfill disposal beginning in 2016.
Refrigerant Management Plan	The Refrigerant Management Plan requires facilities with refrigeration systems with more than 50 pounds of high-GWP refrigerant to: conduct and report periodic leak inspections; promptly repair leaks; and keep service records on site.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Compliance Offset Protocols under the State's Cap-and-Trade Program	Compliance Offset Protocols under the State's Cap-and-Trade Program include a livestock protocol, rice cultivation protocol, and mine methane capture protocol. The protocols provide methods to quantify, report, and credit GHG emission reductions from sectors not covered by the Cap-and-Trade Program.
AB 1257 (Bocanegra, Chapter 749, Statutes of 2013)	AB 1257 directs the CEC to assemble a report by November 2015 (and every four years after), in consultation with other State agencies, to identify strategies for maximizing the benefits obtained from natural gas as an energy source.
AB 1900 (Gatto, Chapter 602, Statutes of 2012)	AB 1900 directed the CPUC to adopt natural gas constituent standards (in consultation with CARB and the Office of Environmental Health and Hazard Assessment). The legislation is also designed to streamline and standardize customer pipeline access rules and encourage the development of statewide policies and programs to promote all sources of biomethane production and distribution.
LCFS	The LCFS requires transportation fuel providers to procure clean fuels to reduce the carbon intensity of California's fuel mix. The LCFS provides a market signal to incentivize using captured methane as a transportation fuel, among other clean fuel options.
SB 1122 (Rubio, Chapter 612, Statutes 2012)	SB 1122 directed the California Public Utility Commission (CPUC) to require the State's investor-owned utilities to develop and offer 10 to 20-year market-price contracts to procure an additional 250 megawatts of cumulative electricity generation from biogas facilities that commence operating on or after June of 2013.
AB 398 (Garcia, Chapter 135, Statutes 2017)	AB 398 directed CARB to extend the Cap-and-Trade Program through 2030, implement a price ceiling and two price containment points, and changes the percentage and nature of offset credits that entities are able to use to meet their compliance obligation.
AB 617 (Garcia, Chapter 136, Statutes of 2017)	AB 617 directs CARB to develop a uniform statewide system of annual reporting of emissions of criteria air pollutants and toxic air contaminants for use by certain categories of stationary sources and requires those sources to report annually. AB 617 also requires CARB to develop a monitoring plan and a statewide 5-year strategy to deal with criteria air pollutant emission has become a high cumulative exposure burden. CARB is to give grants to communities who undertake these efforts. AB 617 also

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	directs any air district in nonattainment for one or more air pollutants to adopt an expedited schedule for the implementation of best available retrofit control technologies.
AB 197 (Garcia, Chapter 250, Statutes of 2016)	AB 197 added two members to the CARB executive board as well as established a new committee to report to the Legislature. AB 197 also requires CARB to annually publish emissions of greenhouse gases, criteria pollutants, and toxic air contaminants for each facility that reports to the state board and air districts. Finally, CARB is required to consider disadvantaged communities and the social cost of carbon when making new rules and regulations.
SB 1018 (Chapter 39, Statutes 2012)	SB 1018 established the Greenhouse Gas Reduction Fund and requires any state agency that has been appropriated money from the fund to prepare a description of proposed expenditures, how the expenditures would further the purposes of the Global Warming Solutions Act of 2006, how the expenditures will achieve specified greenhouse gas emission reductions, and how the agency will document expenditure results. The bill includes provisions to ensure that any decision to link a market-based compliance program (Cap-and-Trade Program) with a program in another jurisdiction as part of AB 32 also include a consideration and adoption of four findings which have been codified in sections 12894(f) and (g) of the Government Code. Prior to linking California's Cap-and-Trade Program, CARB must notify the Governor, who then has 45 days in which to make (or decline to make) four specified findings which are to be submitted to the Legislature. The four findings are intended to ensure that the compliance instruments (i.e., emission allowances and limited offset credits) issued by both programs intended for linkage can be used interchangeably for compliance in either jurisdiction. The four findings require that the proposed program for linkage include requirements for offsets that are equivalent to or stricter than those required by in the California Cap-and-Trade Program, continue to allow California to enforce the Global Warming Solutions Act, include equivalent or stricter enforcement tools for compliance with the program's rules, does not impose a liability on California. See Government Code section 12894(f) and (g) for full findings language.

Table A2-8 Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	The bill also allows the CPUC to allocate 15 percent of the revenues received by electrical corporations for the Greenhouse Gas Fund to residential, small business, and emissions-intensive trade-exposed retail customers for specified clean energy programs.

9. Hazards and Hazardous Materials

Applicable laws and regulations associated with hazards and hazardous materials are discussed in Table A2-9.

Table A2-9 Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
Federal	
CWA (40 CFR 112)	The 1972 amendments to the CWA provide the statutory basis for the NPDES permit program and the basic structure for regulating the discharge of pollutants from point sources to waters of the U.S. Section 402 of the CWA specifically required U.S. EPA to develop and implement the NPDES program.
SDWA	SDWA is the main federal law that ensures the quality of Americans' drinking water. Under the SDWA, U.S. EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. The SDWA does not regulate private wells which serve fewer than 25 individuals.
Federal Hazardous Materials Regulations (FHMR) (Title 49, CFR, Parts 100-180)	The regulations establish criteria for the safe transport of hazardous materials. Compliance is mandatory for intrastate and interstate transportation.
Toxic Substances Control Act (TSCA) 15 U.S.C. Section 2601 et seq.	TSCA provides U.S. EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. TSCA addresses the production, importation, use, and disposal of

Table A2-9
Applicable Laws and Regulations for Hazards and Hazardous Materials

Regulations	Description
	specific chemicals including polychlorinated biphenyls, asbestos, radon and lead-based paint.
Resource Conservation and Recovery Act (RCRA) 42 U.S.C. Section 6901 et seq. (40 CFR)	The RCRA of 1976 gives U.S. EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled U.S. EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. HSWA - the Federal Hazardous and Solid Waste Amendments - are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program. Federal regulations adopted by U.S. EPA are found in Title 40, Code of Federal Regulations 40 CFR.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	CERCLA, commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL. The Superfund Amendments and Reauthorization Act (SARA) of 1986 reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definitions clarifications, and technical requirements were added to the legislation, including additional enforcement authorities. Also, Title III of SARA authorized the Emergency Planning and Community Right-to-Know Act (EPCRA).
EPCRA (42 USC Section 9601 et seq.)	The SARA of 1986 created EPCRA (40 CFR Parts 350-372), also known as SARA Title III, a statute designed to improve community access to information about chemical hazards and to facilitate the development of chemical emergency response plans by state/tribe and local governments. EPCRA required the establishment of state/tribe emergency response commissions, responsible for coordinating certain emergency

Table A2-9 Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
	response activities and for appointing local emergency planning committees.
Fuels and Fuel Additive Program (40 CFR Part 79)	U.S. EPA regulates diesel fuels under two programs; one is administered under the Office of Pollution Prevention and Toxic Substances (OPPTS) and the other is administered under the Transportation and Air Quality group. OPPTS requires that all chemicals produced in the U.S. are registered with the TSCA. The Transportation and Air Quality group requires that any fuels sold for ground transportation purposes must be registered with U.S. EPA and the volumes reported on a quarterly basis.
State	
Hazardous Materials Transportation (Vehicle Code Sections 353; 2500-2505; 31301-31309; 32000-32053; 32100-32109; 31600-31620)	Regulations pertaining to the safe transport of hazardous materials are in California Vehicle Code Sections 31301-31309. All motor carriers and drivers involved in transportation of hazardous materials must comply with the requirements contained in federal and state regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol. A driver is required to obtain a hazardous materials endorsement issued by the driver's country or state of domicile to operate any commercial vehicle carrying hazardous materials. The driver is required to display placards or markings while hauling hazardous waste, unless the driver is exempt from the endorsement requirements. A driver who is a California resident is required to obtain an endorsement from California Highway Patrol.
Hazardous Waste Control Law (Health and Safety Code, Division 20, Chapter 6.5, 22 CCR, Division 4.5)	California requirements and statutory responsibilities in managing hazardous waste in California – this includes the generation, transportation, storage, treatment, recycling, and disposal of hazardous waste. The statute and regulation are implemented by Cal/EPA Department of Toxic Substances Control.
California Accidental Release Prevention (CalARP) Program 19 CCR Division 2, Chapter 4.5, Sections 2735-2785	The purpose of the CalARP program is to prevent accidental releases of substances that can cause serious harm to the public and the environment, to minimize the damage if releases do occur, and to satisfy community right-to-know laws. This is accomplished by requiring businesses that handle more than a threshold quantity of a regulated substance listed in the regulations to develop a Risk Management Plan (RMP). An RMP is a detailed engineering analysis of the potential accident factors present at a business and the mitigation measures that can be implemented to reduce this accident potential.

Table A2-9 Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
Hazardous Material Business Plan & Area Plan Program Health and Safety Code Sections 25500 – 25520 19 CCR, Division 2, Chapter 4, Article 3 & 4	The business and area plans program, relating to the handling and release or threatened release of hazardous materials, was established in California to protect the public health and safety and the environment. Basic information on the location, type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of in the state, which could be accidently released into the environment, is not now available to firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies, and other interested persons. The information provided by business and area plans is necessary in order to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of hazardous materials into the workplace and environment. CUPAs use information collected from the Business Plan and CalARP programs to identify hazardous materials in their communities. This information provides the basis for the Area Plan and is used to determine the appropriate level of emergency planning necessary to respond to a release.
Unified Program Administration Health and Safety Code, Chapter 6.11, Sections 25404-25404.8 27 CCR, Division 1, Subdivision 4, Chapter 1, Sections 15100-15620	A CUPA, which is authorized by the Secretary of Cal/EPA to carry out several of the hazardous waste/hazardous materials regulatory programs administered by the State in a coordinated and consistent manner. The six hazardous waste and materials program elements covered by the CUPA include: 1) Hazardous Waste Generators 2) Underground Tanks 3) Above Ground Tanks 4) Accidental Release Program 5) Hazardous Material Release Response Plans & Spill Notification 6) Hazardous Materials Management Plans & Inventory Reporting The intent of the CUPA is to simplify the hazardous materials regulatory environment and provide a single point of contact for businesses to address inspection, permitting, billing, and enforcement issues.
Local	
Various Local Ordinances	Various ordinances and codes may be adopted at the local level to provide stricter requirements in the management of hazardous materials and waste activities within the jurisdiction.

10. Hydrology and Water Quality

Applicable laws and regulations associated with hydrology, water quality, and water supply are discussed in Table A2-10.

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
Federal	
National Flood Insurance Program (FEMA)	Designated floodplain mapping program, flooding and flood hazard reduction implementation, and federal subsidized flood insurance for residential and commercial property. Administered by the FEMA.
EO 11988	Requires actions to be taken for federal activities to reduce the risks of flood losses, restore and preserve floodplains, and minimize flooding impacts to human health and safety.
CWA	Administered primarily by the EPA. Pertains to water quality standards, state responsibilities, and discharges of waste to waters of the U.S. Sections 303, 401, 402, and 404.
CWA Section 303	Defines water quality standards consisting of: 1) designated beneficial uses of a water, 2) the water quality criteria (or ”objectives” in California) necessary to support the uses, and 3) an antidegradation policy that protects existing uses and high water quality. Section 303(d) requires states to identify water quality impairments where conventional control methods will not achieve compliance with the standards, and establish total maximum daily load programs to achieve compliance.
CWA Section 401	State certification system for federal actions which may impose conditions on a project to ensure compliance with water quality standards.
CWA Section 402	Section 402 mandates permits for municipal stormwater discharges, which are regulated under the NPDES General Permit for Municipal Separate Storm Sewer Systems (MS4) (MS4 Permit). Several of the cities and counties issue their own NPDES municipal stormwater permits for the regulations of stormwater discharges. These permits require that controls are implemented to reduce the discharge of pollutants in stormwater discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures as appropriate. As part of permit compliance, these permit holders have created Stormwater Management Plans for their respective locations. These plans outline the requirements for municipal operations, industrial and commercial businesses, construction sites, and planning and land development. These

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
	requirements may include multiple measures to control pollutants in stormwater discharge. During implementation of specific projects, applicants will be required to follow the guidance contained in the Stormwater Management Plans as defined by the permit holder in that location.
CWA Section 404	Permit system for dredging or filling activity in waters of the United States, including wetlands, and administered by USACE.
National Toxics Rule and California Toxics Rule	Applicable receiving water quality criteria promulgated by U.S. EPA for priority toxic pollutants consisting generally of trace metals, synthetic organic compounds, and pesticides.
State	
California Water Rights	The SWRCB administers review, assessment, and approval of appropriative (or priority) surface water rights permits/licenses for diversion and storage for beneficial use. Riparian water rights apply to the land and allow diversion of natural flows for beneficial uses without a permit, but users must share the resources equitably during drought. Groundwater management planning is a function of local government. Groundwater use by overlying property owners is not formally regulated, except in cases where the groundwater basin supplies are limited and uses have been adjudicated, or through appropriative procedures for groundwater transfers.
Public Trust Doctrine	Body of common law that requires the state to consider additional terms and conditions when issuing or reconsidering appropriative water rights to balance the use of the water for many beneficial uses irrespective of the water rights that have been established. Public trust resources have traditionally included navigation, commerce, and fishing and have expanded over the years to include protection of fish and wildlife, and preservation goals for scientific study, scenic qualities, and open-space uses.
Porter-Cologne Water Quality Control Act and California Water Code (Water Code Sections 13000 et seq. and 23 CCR)	The SWRCB is responsible for statewide water quality policy development and exercises the powers delegated to the State by the federal government under the CWA. Nine RWQCBs adopt and implement water quality control plans (Basin Plans) which designate beneficial uses of surface waters and groundwater aquifers, and establish numeric and narrative water quality objectives for beneficial use protection. RWQCBs issue waste discharge requirements for discharge activities to water and land, require monitoring and maintain reporting programs, and implement enforcement and compliance policies

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
	and procedures. Other state agencies with jurisdiction in water quality regulation in California include the Department of Public Health (drinking water regulations), DPR, DTSC, CDFW, and the OEHHA.
Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California	Commonly referred to as the State Implementation Policy (SIP), the SIP provides implementation procedures for discharges of toxic pollutants to receiving waters.
Thermal Plan	The Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California was adopted by the SWRCB in 1972 and amended in 1975. The Thermal Plan restricts discharges of thermal waste or elevated temperature waste to waters of the state. Generally, the Thermal Plan prohibits discharges from increasing ambient temperatures by more than 1ºF over more than 25 percent of a stream cross section, increasing ambient temperatures by more than 4ºF in any location, and prohibits discharge of waste that exceeds more than 20ºF above the ambient temperature.
Statewide NPDES General Permit for Stormwater Associated with Land Disturbance and Construction Activity (Order No. 2009-0009-DWQ, NPDES No. CAR000002)	NPDES permit for stormwater and non-storm discharges from construction activity that disturbs greater than 1 acre. The general construction permit requires the preparation of a SWPPP that identifies BMPs to be implemented to control pollution of storm water runoff. The permit specifies minimum construction BMPs based on a risk-level determination of the potential of the project site to contribute to erosion and sediment transport and sensitivity of receiving waters to sediment. While small amounts of construction-related dewatering are covered under the General Construction Permit, the RWQCB has also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Dewatering Permit). This permit applies to various categories of dewatering activities and may apply to some construction sites, if construction of specific projects required dewatering in greater quantities than that allowed by the General Construction Permit and discharged the effluent to surface waters. The General Dewatering Permit contains waste

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
	discharge limitations and prohibitions similar to those in the General Construction Permit.
Statewide NPDES General Permit for Discharges of Stormwater Associated with Industrial Facilities (Order No. 97-003-DWQ, NPDES No. CAS000001)	NPDES permit for stormwater and non-storm discharges from construction activity that disturbs 1 acre or more. The general construction permit requires the preparation of a SWPPP that identifies best management practices (BMPs) to be implemented to control pollution of storm water runoff. The permit specifies minimum construction BMPs based on a risk-level determination of the potential of the project site to contribute to erosion and sediment transport and sensitivity of receiving waters to sediment. While small amounts of construction-related dewatering are covered under the General Construction Permit, RWQCBs have also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Dewatering Permit). This permit applies to various categories of dewatering activities and may apply to some construction sites, if construction of specific projects required dewatering in greater quantities than that allowed by the General Construction Permit and discharged the effluent to surface waters. The General Dewatering Permit contains waste discharge limitations and prohibitions similar to those in the General Construction Permit.
SB 1168, Statutes of 2014 Chapter 346, Pavley	This bill requires all groundwater basins designated as high- or medium-priority basins by DWR that are designated as basins subject to critical conditions of overdraft to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2020, and requires all other groundwater basins designated as high- or medium-priority basins to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2022. This bill would require a groundwater sustainability plan to be developed and implemented to meet the sustainability goal, established as prescribed, and would require the plan to include prescribed components.
AB 1739, Statutes of 2014, Dickinson, Chapter 347	This bill establishes groundwater reporting requirements for a person extracting groundwater in an area within a basin that is not within the management area of a groundwater sustainability agency or a probationary basin. The bill requires the reports to be submitted to the SWRCB or, in certain areas, to an entity designated as a local agency by the SWRCB.

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
SB 1319, Statutes of 2014, Chapter 348, Pavley	This bill allows the SWRCB to designate a groundwater basin as a probationary basin subject to sustainable groundwater management requirements. This bill also authorizes SWRCB to develop an interim management plan in consultation with the DWR under specified conditions.
Mining and Mineral Policy Act	The Mining and Mineral Act of 1970 declared that the Federal Government policy is to encourage private enterprise in the development of a sound and stable domestic mineral industry, domestic mineral deposits, minerals research, and methods for reclamation in the minerals industry.
Local	
Water Agencies	Water agencies enter into contracts or agreements with the federal and state governments to protect the water supply and to ensure the lands within the agency have a dependable supply of suitable quality water to meet present and future needs.
Floodplain Management	General plans guide county land use decisions, and require the identification of water resource protection goals, objectives, and policies. Floodplain management is addressed through ordinances, land use planning, and development design review and approval. Local actions may be coordinated with FEMA for the National Flood Insurance Program. Typical provisions address floodplain use restrictions, flood protection requirement, allowable alteration of floodplains and stream channels, control of fill and grading activities in floodplains, and prevention of flood diversions where flows would increase flood hazards in other areas.
Drainage, Grading, and Erosion Control Ordinances	Counties regulate building activity under the federal Uniform Building Code, local ordinances, and related development design review, approval, and permitting. Local ordinances are common for water quality protection addressing drainage, stormwater management, land grading, and erosion and sedimentation control.
Environmental Health	The RWQCBs generally delegate permit authority to county health departments to regulate the construction and operation/maintenance of on-site sewage disposal systems (e.g., septic systems and leach fields, cesspools).

11. Land Use and Planning

Applicable laws and regulations associated with land use and planning are discussed in Table A2-11.

Table A2-11
Applicable Laws and Regulations for Land Use and Planning

Regulation	Description
Federal	
FLPMA	FLPMA is the principal law governing how the BLM manages public lands. FLPMA requires the BLM to manage public land resources for multiple use and sustained yield for both present and future generations. Under FLPMA, the BLM is authorized to grant rights-of-way for generation, transmission, and distribution of electrical energy. Although local agencies do not have jurisdiction over the federal lands managed by the BLM, under FLPMA and the BLM regulations at 43 CFR Part 1600, the BLM must coordinate its planning efforts with state and local planning initiatives. FLPMA defines an Area of Critical Environmental Concern (ACEC) as an area within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. The BLM identifies, evaluates, and designates ACECs through its resource management planning process. Allowable management practices and uses, mitigation, and use limitations, if any, are described in the planning document and the concurrent or subsequent ACEC Management Plan. ACECs are considered land use authorization avoidance areas because they are known to contain resource values that could result in denial of applications for land uses that cannot be designed to be compatible with management objectives and prescriptions for the ACEC.
BLM Resource Management Plans	Established by FLPMA, Resource Management Plans are designed to protect present and future land uses and to identify management practices needed to achieve desired conditions within the management area covered by the Resource Management Plans. Management direction is set forth in the Resource Management Plans in the form of goals, objectives, standards, and guidelines. These, in turn, direct management actions, activities, and uses that affect land management, and water, recreation, visual, natural, and cultural resources.
NFMA	NFMA is the primary statute governing the administration of national forests. The act requires the Secretary of Agriculture to

Table A2-11 Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
	assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. Goal 4 of the USFS's National Strategic Plan for the National Forests states that the nation's forests and grasslands play a significant role in meeting America's need for producing and transmitting energy. Unless otherwise restricted, National Forest Service lands are available for energy exploration, development, and infrastructure (e.g., well sites, pipelines, and transmission lines). However, the emphasis on non-recreational special uses, such as utility corridors, is to authorize the special uses only when they cannot be reasonably accommodated on non-National Forest Service lands.
State	
State Planning and Zoning Law (California Government Code Section 65300 et seq.)	California Government Code section 65300 et seq. establishes the obligation of cities and counties to adopt and implement general plans. The general plan is a comprehensive, long-term, and general document that describes plans for the physical development of the city or county. The general plan addresses a broad range of topics, including, at a minimum, land use, circulation, housing, conservation, open space, noise, and safety. In addressing these topics, the general plan identifies the goals, objectives, policies, principles, standards, and plan proposals that support the city or county's vision for the area. The general plan is also a long-range document that typically addresses the physical character of an area over a 20-year period. Although the general plan serves as a blueprint for future development and identifies the overall vision for the planning area, it remains general enough to allow for flexibility in the approach taken to achieve the plan's goals.

Table A2-11
Applicable Laws and Regulations for Land Use and Planning

Regulation	Description
Subdivision Map Act (Government Code section 66410 et seq.)	In general, land cannot be divided in California without local government approval. The primary goals of the Subdivision Map Act are: (a) to encourage orderly community development by providing for the regulation and control of the design and improvements of the subdivision with a proper consideration of its relation to adjoining areas; (b) to ensure that the areas within the subdivision that are dedicated for public purposes will be properly improved by the subdivider so that they will not become an undue burden on the community; and (c) to protect the public and individual transferees from fraud and exploitation. (61 Ops. Cal.Atty. Gen. 299, 301 [1978]; 77 Ops. Cal.Atty. Gen. 185 [1994]). Dividing land for sale, lease or financing is regulated by local ordinances based on the state Subdivision Map Act (Government Code section 66410 et seq.).
SB 375, Statutes of 2008	SB 375 augments the existing federal requirement for MPOs to develop RTPs for their respective regions. Under SB 375, MPOs must prepare an SCS to supplement their RTPs. RTP/SCSs contain land use strategies to reduce vehicle miles traveled (VMT) related emissions of GHGs. Following the adoption of an RTP/SCSs, land use strategies must be implemented at the local level by land use agencies.
Local	
General Plans	The most comprehensive land use planning is provided by city and county general plans, which local governments are required by State law to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by state law or which the jurisdiction has chosen to include. Required topics are: land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address are public facilities, parks and recreation, community design, or growth management, among others. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas).
Specific and Community Plans	A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan. Specific and community plans are required to be consistent with the city or county's general plan.

Table A2-11 Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
Zoning	The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan, except in charter cities.
CEQA Guidelines Section 15332	CEQA Guidelines Section 15332 provides for certain types of infill projects that may be determined to be categorically exempt from CEQA review by local lead agencies. Infill projects that may be exempt from environmental review under this class of categorical exemption must: be consistent with the applicable general plan and zoning designations; be within city limits and on a parcel no greater than five acres; not contain valuable habitat for any federal or State listed species; not contribute to any significant effects to traffic, noise, or air and water quality; and be adequately served by existing utilities and public services.

12. Noise

Applicable laws and regulations associated with noise are discussed in Table A2-12.

Table A2-12 Applicable Laws and Regulations for Noise	
Regulation	**Description**
Federal	
Federal Noise Control Act (1972) EPA (40 CFR 201-211)	This act established a requirement that all federal agencies administer their programs to promote an environment free of noise that jeopardizes public health or welfare. U.S. EPA was given the responsibility for providing information to the public regarding identifiable effects of noise on public health or welfare, publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety, coordinating federal research and activities related to noise control, and establishing federal noise emission standards for selected products distributed in interstate commerce. This act also directed that all federal agencies comply with applicable federal, state, interstate, and local noise control regulations.
Quiet Communities Act (1978)	This act promotes the development of effective state and local noise control programs, to provide funds for noise research, and

Table A2-12
Applicable Laws and Regulations for Noise

Regulation	Description
	to produce and disseminate educational materials to the public on the harmful effects of noise and ways to effectively control it.
14 CFR, Part 150 (FAA)	These address airport noise compatibility planning and include a system for measuring airport noise impacts and present guidelines for identifying incompatible land uses. All land uses are considered compatible with noise levels of less than 65 dBA L_{dn}. At higher noise levels, selected land uses are also deemed acceptable, depending on the nature of the use and the degree of structural noise attenuation provided.
International Standards and Recommended Practices (International Civil Aviation Organization)	This contains policies and procedures for considering environmental impacts (e.g., aircraft noise emission standards and atmospheric sound attenuation factors).
32 CFR, Part 256 (Department of Defense Air Installations Compatible Use Zones [AICUZ] Program)	AICUZ plans prepared for individual airfields are primarily intended as recommendations to local communities regarding the importance of maintaining land uses which are compatible with the noise and safety impacts of military aircraft operations.
23 CFR, Part 772, Federal Highway Administration (FHWA) standards, policies, and procedures	FHWA standards, policies, and procedures provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways.
29 CFR, Part 1910, Section 1910.95 (U.S. Department of Labor Occupational Safety and Health Administration)	This regulation established a standard for noise exposure in the workplace.
FTA Guidance	This guidance presents procedures for predicting and assessing noise and vibration impacts of proposed mass transit projects. All types of bus and rail projects are covered. Procedures for assessing noise and vibration impacts are provided for different stages of project development, from early planning before mode and alignment have been selected through preliminary engineering and final design. Both for noise and vibration, there are three levels of analysis described. The framework acts as a

Table A2-12 Applicable Laws and Regulations for Noise	
Regulation	**Description**
	screening process, reserving detailed analysis for projects with the greatest potential for impacts while allowing a simpler process for projects with little or no effects. This guidance contains noise and vibration impact criteria that are used to assess the magnitude of predicted impacts. A range of mitigation is described for dealing with adverse noise and vibration impacts.
49 CFR 210 (Federal Rail Administration [FRA] Railroad Noise Emission Compliance Standards) and FRA Guidance (2005)	This section and guidance provides contains criteria and procedures for use in analyzing the potential noise and vibration impacts of various types of high-speed fixed guideway transportation systems.
State	
CPUC Section 21670	The State Aeronautics Act of the CPUC establishes statewide requirements for airport land use compatibility planning and requires nearly every county to create an Airport Land Use Commission or other alternative.
California Airport Noise Regulations promulgated in accordance with the State Aeronautics Act (21 CCR Section 5000 et seq.)	In Section 5006, the regulations state that: “The level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a CNEL value of 65 dBA for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep, and community reaction.
24 CCR, Part 2	These establish standards governing interior noise levels that apply to all new single-family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing L_{dn} exceeds 60 dBA. Such acoustical studies are required to establish mitigation that will limit maximum L_{dn} levels to 45 dBA in any habitable room.
Local	
City/County General Plan Noise Elements	Local general plans in California must include a noise element per Government Code Section 65302(f). The General Plan Guidelines maintained and published by OPR provide detailed guidance to local agencies on standards and

Table A2-12
Applicable Laws and Regulations for Noise

Regulation	Description
	methods of analysis that should be used when developing or updating a noise element. Local governments must "analyze and quantify" noise levels and the extent of noise exposure through actual measurement or the use of noise modeling. Technical data relating to mobile and point sources must be collected and synthesized into a set of noise control policies and programs that "minimizes the exposure of community residents to excessive noise." Noise level contours must be mapped, and the conclusions of the element must be used as a basis for land use decisions. The noise element must include implementation measures and possible solutions to existing and foreseeable noise problems. Furthermore, the policies and standards must be sufficient to serve as a guideline for compliance with sound transmission control requirements. The noise element directly correlates to the land use, circulation, and housing elements. A noise element is to be used as "a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise." (OPR 2003)
City/County Noise Regulations	Most local governments in California maintain and enforce noise regulations contained in local codes and ordinances that apply to diverse types of activities in the community. These regulations may include noise standards that apply to construction activities associated with new development projects, as well as ongoing operational activities associated with existing or future land uses.

13. Employment, Population, and Housing

See land use planning and housing-related regulations in Section 11.0, Land Use and Planning.

14. Public Services

Applicable laws and regulations associated with public services are discussed in Table A2-13.

Table A2-13
Applicable Laws and Regulations for Public Services

Regulation	Description
Federal	
	None applicable
American with Disabilities Act	Guidelines to ensure that facilities are accessible to individuals with disabilities. Implements requirements for the design and construction of buildings.
State	
State Fire Responsibility Areas	Areas delineated by the CAL FIRE for which the state assumes primary financial responsibility for protecting natural resources from damages of fire. Local jurisdictions are required to adopt minimum recommended requirements for road design, road identification, emergency fire suppression and fuel breaks and greenbelts. All projects within or adjacent to a State Fire Responsibility Area must meet these requirements.
State School Funding	Education Code Section 17620 authorizes school districts to levy a fee, charge, dedication, or other requirement for any development project for the construction or reconstruction of school facilities.

15. Recreation

Applicable laws and regulations associated with recreation are discussed in Table A2-14.

Table A2-14
Applicable Laws and Regulations for Recreation

Regulation	Description
Federal	
FLPMA, 1976 – 43 CFR 1600	Establishes public land policy; guidelines for administration; and provides for the "multiple use" management, protection, development, and enhancement of public lands. Multiple use management, defined as "management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people" with recreation identified as one of the resource values.

Table A2-14 Applicable Laws and Regulations for Recreation	
Regulation	**Description**
State	
	None applicable
Local	
General Plans	General plans for cities and counties contain designations for recreational areas. These are policy documents with planned land use maps and related information that are designed to give long-range guidance to those local officials making decisions affecting the growth and resources of their jurisdictions. Because of the number and variety of general plans and related local plans, they are not listed individually.

16. Transportation, Traffic, and Shipping

Applicable laws and regulations associated with transportation and traffic are discussed in Table A2-15.

Table A2-15 Applicable Laws and Regulations for Transportation and Traffic	
Regulation	**Description**
Federal	
40 CFR, Part 77 (FAA)	Requires a determination of no hazard to air navigation for structures that will be more than 200 feet above ground level.
State	
SB 375, Statutes of 2008	The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) supplements the requirements under the Federal-Aid Highway Act. In addition to preparing RTPs, under SB 375, MPOs must develop SCSs that address VMT-related GHG emissions and include strategies to reduce emissions. Through the RTP/SCSs, MPOs allocate federal and State transportation funding to local and regional projects that would reduce VMT-related emissions.
SB 743, Statutes of 2013, Chapter 386	SB 743, passed in 2013, requires OPR to develop new CEQA guidelines that address traffic metrics under CEQA. As stated in the legislation, upon adoption of the new guidelines, “automobile delay, as described solely by level

Table A2-15 Applicable Laws and Regulations for Transportation and Traffic	
Regulation	**Description**
	of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any." CNRA is currently in the process of reviewing the updates to the CEQA Guidelines proposed by OPR.
California Vehicle Code (VC) Sections 353; 2500-2505; 31303-31309; 32000-32053; 32100-32109; 31600-31620; California Health and Safety Code Section 25160 et seq.	Regulates the highway transport of hazardous materials.
VC Sections 13369; 15275 and 15278	Addresses the licensing of drivers and the classification of licenses required for the operation of particular types of vehicles and also requires certificates permitting operation of vehicles transporting hazardous materials.
VC Sections 35100 et seq.; 35250 et seq.; 35400 et seq.	Specifies limits for vehicle width, height, and length.
VC Section 35780	Requires permits for any load exceeding Caltrans weight, length, or width standards on public roadways.
California Streets and Highways Code Section 117, 660-672	Requires permits for any load exceeding Caltrans weight, length, or width standards on County roads.
California Streets and Highways Code Sections 117, 660-670, 1450, 1460 et seq., and 1480 et seq.	Regulate permits from Caltrans for any roadway encroachment from facilities that require construction, maintenance, or repairs on or across State highways and County roads.
CEQA [Public Resources Code CEQA Sections 21099(b)(2) and (c)(1)]	CEQA Section 21099(b)(2) states that automobile delay, as described solely by level of service or similar measures of traffic congestion are not a significant environmental impact except in certain specified locations. Section 21099(c)(1) permits OPR to establish alternative metrics for assessing traffic impacts outside transit priority areas.
Local	
City/County Codes	Many local governments in California maintain and enforce local codes that apply standards to transportation facilities and services.

17. Utilities and Service Systems

Applicable laws and regulations associated with utilities are discussed in Table A2-16.

Table A2-16
Applicable Laws and Regulations for Utilities

Regulation	Description
Federal	
Federal Power Act of 1935	In the Federal Power Act of 1935 (49 Stat. 803), created the Federal Power Commission, an independent regulatory agency with authority over both the interstate transmission of electricity and the sale of hydroelectric power at the wholesale level. The act requires the commission to ensure that electricity rates are "reasonable, nondiscriminatory and just to the consumer." The Federal Power Act of 1935 also amended the criteria that the commission must apply in deciding whether to license the construction and operation of new hydroelectric facilities.
Natural Gas Act (NGA) of 1938	Together with the Federal Power Act of 1935, the NGA of 1938 (P.L. 75-688, 52 Stat. 821) was an essential piece of energy legislation in the first half of the 20th century. These statutes regulated interstate activities of the electric and natural gas industries, respectively. The acts are similarly structured and constitute the classic form of command-and-control regulation authorizing the federal government to enter into a regulatory compact with utilities. In short, the NGA enabled federal regulators to set prices for gas sold in interstate commerce in exchange for exclusive rights to transport the gas.
Natural Gas Policy Act of (NGPA) 1978	The NGPA granted the FERC authority over intrastate as well as interstate natural gas production. The NGPA established price ceilings for wellhead first sales of gas that vary with the applicable gas category and gradually increase over time.
State	
Waste Heat and Carbon Emissions Reduction Act of 2007	The Waste Heat and Carbon Emissions Reduction Act of 2007 SARA AB 1613), placed requirements on the CPUC, the CEC, and local electric utilities to develop incentive programs and technical efficiency guidelines to encourage the installation of small CHP systems. The CEC approved efficiency and certification guidelines for eligible systems under AB 1613 in January 2010, and the CPUC approved standardized contracting and pricing provisions between CHP operators and the Investor Owned Utilities in November 2012.
AB 1900 (Gatto, Chapter 602, Statutes of 2012)	AB 1900 directed the CPUC to adopt natural gas constituent standards (in consultation with CARB and the OEHHA). The legislation is also designed to streamline and standardize

Table A2-16 Applicable Laws and Regulations for Utilities	
Regulation	**Description**
	customer pipeline access rules, and encourage the development of statewide policies and programs to promote all sources of biomethane production and distribution.
Section 21151.9 of the PRC/ Water Code Section 10910 et seq.	Required the preparation of a water supply assessment (WSA) for large developments. These assessments are prepared by public water agencies responsible for providing service and address whether there are adequate existing and projected future water supplies to serve the proposed project. All projects that meet the qualifications for preparing a WSA must identify the water supplies and quantities that would serve the project as well as project the total water demand for the service area (including the project's water demands) by source in 5-year increments over a 20-year period. This information must include data for a normal, single-dry, and multiple-dry years. The WSA is required to be approved by the water service agency before the project can be implemented.
Local	
City/County General Plan	Local general plans in California must include a circulation element per Government Code Section 65302(b), which includes identification of the locations and extent of existing and proposed public utilities and facilities. The circulation element of a general plan should assess the adequacy and availability of community water, sewer, and drainage facilities and the need for expansion and improvements; trends in peak and average daily flows; the number and location of existing and proposed power plants, oil and gas pipelines, and major electric transmission lines and corridors; existing and projected capacity of treatment plants and trunk lines; and potential future development of power plants (OPR 2003).
City/County Codes and Ordinances	Most cities and counties have adopted municipal codes and ordinances that pertain to utilities and service systems. Local codes and ordinances include, but not limited to, limitations on the locations of wells, sewers, and other water-related facilities; and development standards for future utility land use projects.

18. UNFCCC Decisions

The following table outlines key decisions within the UNFCCC related to efforts to reduce emissions from tropical deforestation. Additional specific decisions and other UNFCCC decisions related to tropical forests are available through the UNFCCC website, here: https://redd.unfccc.int/fact-sheets/unfccc-negotiations.html.

Table A2-17
Applicable UNFCCC Decisions

Regulation/Decision	Description
UNFCCC	
U.N. Doc. FCCC/CP/2005/5	The concept of reducing emissions from the deforestation and degradation of tropical forests (called REDD in the UNFCCC discussions), first arose as part of the UNFCCC negotiations in 2005 at the 11th Conference of the Parties (COP) to the UNFCCC. The concept gained broad support because of a recognition of the need to expand country participation beyond Annex I (i.e., developed) countries in order to achieve real climate change results. At that meeting, the Parties to the UNFCCC directed the Subsidiary Body for Scientific and Technological Advice to work on scientific, technical, and methodological issues related to designing REDD projects and programs. (UNFCCC 2005)
Decision 1/CP.13 U.N. Doc. FCCC/CP/2007/6/Add.1	Since 2005, Parties to the UNFCCC have considered further decisions regarding the development and implementation of REDD programs. For instance, in 2007, the Parties adopted the Bali Action Plan, which included “an action point aimed at reducing emissions from forests and called for a decision to be made by the Parties…on how this would be brought about” in December 2009. The Plan also encouraged consideration of “the role of conservation [and the] sustainable management of forests and forest carbon stocks in developing countries.” (UNFCCC 2007)
U.N. Doc. FCCC/SBSTA/2008/11	In 2008, the Subsidiary Body for Scientific and Technological Advice presented a report identifying methodological issues associated with REDD at COP 14 in Poznán, Poland. Its report placed equal emphasis on conservation and sustainable management of forests, and enhancement of forest carbon stocks, deforestation and forest degradation. In the nomenclature of the UNFCCC discussions, activities to reduce emissions from deforestation and forest degradation have varied in scope as follows: 1)

Table A2-17
Applicable UNFCCC Decisions

Regulation/Decision	Description
	activities to reduce emissions from deforestation (i.e., RED); 2) activities that reduce emissions from deforestation and forest degradation (i.e., the second "D" in REDD); and 3) activities which also include the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks (i.e., REDD+ or REDD-plus). (UNFCCC 2008)
Decision 2/CP.15 U.N. Doc. FCCC/CP/2009/11/Add.1	In 2009, at COP 15 in Copenhagen, Denmark, Parties adopted the Copenhagen Accord, which "recognized the crucial role of" REDD to reduce global climate change, and developed countries committed to providing financial resources for mitigation actions in developing countries. The Accord requested "Parties to identify the drivers of deforestation and forest degradation resulting in emissions[,] along with means to address them," and directed Parties to use the most recent IPCC guidelines to "estimate and monitor forest-related greenhouse gas emissions and removals and changes in forest cover." COP 15 also emphasized the need for methodological guidance, guidance on potential work that may be needed to support these activities, support for capacity-building and inclusion of local communities in monitoring and reporting, and guidance for the establishment of forest reference emission and reference levels. (UNFCCC 2009)
Decision 1/CP.16 U.N. Doc. FCCC/CP/2010/7/Add.1	In 2010, at COP 16 in Cancun, Mexico, Parties reaffirmed their commitment to "slow, halt, and reverse forest cover and carbon loss" in what came to be called the Cancun Agreements. Parties also established a phased approach for REDD-plus implementation and agreed to support the inclusion of social and environmental safeguards when undertaking REDD activities. COP 16 also established the Green Climate Fund as the "operating entity of the financial mechanism of the Convention," although Parties did not identify a specific funding mechanism for REDD-plus at that time. Parties pledged $100 billion per year to the fund, but it has yet to be fully financed. (UNFCCC 2010)
Decision 2/CP.17 U.N. Doc. FCCC/CP/2011/9/Add.1	In 2011, at COP 17 in Durban, South Africa, Parties agreed in Decision 12/CP.17 that multiple financing options for REDD-plus would be needed, and agreed that these should include public, private, bilateral,

Table A2-17 Applicable UNFCCC Decisions	
Regulation/Decision	**Description**
	multilateral, and market-based sources. Decision 12/CP.17 continued the discussion on social and environmental safeguards, including the kind of information to be reported to demonstrate how safeguards are being "addressed and respected." Importantly, Decision 12/CP.17 also provided guidance on establishing reference levels (i.e., forest stock baselines and emissions baselines) as a basis for a rigorous measurement, reporting, and verification scheme. Parties decided that reference levels should be consistent with each country's greenhouse gas inventories, and should be guided by the most recent IPCC guidance and guidelines to ensure that they are keeping up with any methodological advancements. This "Durban Platform," as the agreements from COP 17 have come to be called, also explicitly recognized a role for subnational efforts in developing REDD programs. (UNFCCC 2011)
Decision 1/CP.18 U.N. Doc. FCCC/CP/2012/8/Add.1	Since the Durban Platform, the Subsidiary Body for Scientific and Technological Advice has continued its consideration of measurement, reporting, and verification methods, as well as safeguard issues. COP 18 included a request from the Parties that the Subsidiary Body for Scientific and Technological Advice continue to consider measurement, reporting, and verification methodological guidance and other technical and policy approaches to REDD. (UNFCCC 2012)
Decision 12/CP.19 U.N. Doc. FCCC/CP/2013/10/Add.1	In November 2013, at COP 19 in Warsaw, Poland, the Parties made progress on REDD by agreeing to enforce safeguards, and to lay the groundwork for reporting, monitoring, and verifying emission reductions, as well as agreeing on broad financing mechanism language and instituting national reference levels and monitoring systems. (UNFCCC 2013)
Decision 2/CP.20 U.N. Doc. FCCC/CP/2014/10/Add.2	At COP 20 in Lima, Peru in 2014 numerous countries with tropical forests submitted their deforestation reference levels to the United Nations. Reference levels inform baseline emissions against which reductions in emissions can be measured and potentially credited. (UNFCCC 2014)
U.N. Doc. FCCC/SBSTA/2015/2/Add.1	During the Subsidiary Body for Scientific and Technological Advice Intersessional Meeting in Bonn,

Table A2-17
Applicable UNFCCC Decisions

Regulation/Decision	Description
	Germany in June 2015, negotiators agreed on draft recommendations to resolve technical issues related to reporting of safeguards, sustainable management, and non-carbon benefits of REDD. (UNFCCC 2015a)
Decision 1/CP.21 U.N. Doc. FCCC/CP/2015/10/Add.1	In 2015, at COP 21 in Paris, the Parties adopted the Paris Agreement, which includes specific language related to forests in Article 5 of the Agreement. Work within the UNFCCC and its subsidiary bodies has continued to define the specific elements of country submissions and planning on REDD efforts. (UNFCCC 2015b) .

See here for further details: https://redd.unfccc.int/fact-sheets/unfccc-negotiations.html

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