APPENDIX F

DRAFT
ENVIRONMENTAL ANALYSIS
FOR THE
PROPOSED FIRST UPDATE
TO THE CLIMATE CHANGE
SCOPING PLAN

APPENDIX F
Draft Environmental Analysis

Prepared for the
Proposed First Update to the Climate Change Scoping Plan

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1.0 INTRODUCTION AND BACKGROUND

A. Background on 2008 Climate Change Scoping Plan

Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006 (AB 32, Statutes of 2006, Chapter 488) declares that global warming poses a serious threat to the economic well-being, public health, natural resources, and environment of California and charges the Air Resources Board (ARB) with "monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases." (Health & Saf. Code, § 38510.) AB 32 provided initial direction on creating a comprehensive multi-year program to limit California's greenhouse gas (GHG) emissions to 1990 levels by 2020 and initiate the transformations required to achieve the State's long-range climate objectives. One specific requirement of AB 32 is to prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020. (Health & Saf. Code, § 38561, subd. (a).)

The first AB 32 scoping plan (initial Scoping Plan), approved in 2008 and reapproved in 2011, contains a mix of recommended strategies that combine direct regulations, market-based approaches, voluntary measures, policies, and other emission-reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives.

B. Required Update

AB 32 requires ARB to update the State's Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions of GHG emissions at least once every five years. (Health & Saf. Code, § 38561, subd. (h).) The Proposed First Update to the Climate Change Scoping Plan (Proposed Update), released for public review on February 10, 2014, continues with the approach of the initial Scoping Plan by recommending a balanced mix of strategies to ensure that California remains on track to meet its long-term climate stabilization objectives. The Proposed Update highlights California's success to date in reducing GHG emissions and lays the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050, as required by AB 32, Executive Order S-3-05, and Governor Brown's Executive Order B-16-2012. The 2050 objective is consistent with an Intergovernmental Panel on Climate Change (IPCC)[1] analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million carbon dioxide equivalent (CO_2e) and reduce the likelihood of catastrophic climate change.

[1] The IPCC is the leading international body for the scientific assessment of climate change established in 1988 under the auspices of the United Nations.

C. Environmental Review Process

1. ARB's Certified Regulatory Program under CEQA

ARB, as the lead agency for the Proposed Update, prepared this Draft Environmental Analysis (EA) in accordance with its certified regulatory program (Cal. Code Regs., tit. 17, §§ 60000 – 60008) to comply with the requirements of the California Environmental Quality Act (CEQA). (Pub. Resources Code, § 21000 et seq.) Public agencies with certified regulatory programs are exempt from certain requirements under CEQA, including but not limited to, preparing environmental impact reports, negative declarations, and initial studies. (Pub. Resources Code, § 21080.5; Cal. Code Regs., tit. 14, §15252.) The resource areas from the Environmental Checklist in Appendix G of the CEQA Guidelines were used as a framework for assessing the potential for significant impacts.

2. Supplemental Analysis

This EA supplements the environmental analysis prepared for the initial Scoping Plan in the *California Environmental Quality Act Functional Equivalent Document* (2008 FED) and *2011 Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (2011 Supplement) by assessing the potential for adverse and beneficial environmental impacts associated with the recommended actions identified in the Proposed Update that could be approved and become effective to further reduce GHG emissions. A brief summary of the prior environmental analyses is provided below:

a) 2008 Climate Change Scoping Plan Functional Equivalent Document

In 2008, ARB, acting as the CEQA lead agency under its certified regulatory program, prepared the 2008 FED that was included as Appendix J (Volume III) to the AB 32 Scoping Plan document. The 2008 FED analyzed the reasonably foreseeable indirect environmental impacts that could result from implementing the measures recommended in the initial Scoping Plan. The 2008 FED also included an analysis of a range of five alternatives to the initial Scoping Plan, including a "no project" alternative, a plan relying primarily on a Cap-and-Trade Regulation for the sectors included in a cap, a plan relying more on source-specific regulatory requirements with no cap-and-trade component, a plan relying on a carbon fee or tax, and a plan relying on variations of proposed strategies and measures. Following the public review and comment period, the initial Scoping Plan and the 2008 FED were considered by the Board at a public hearing in December 2008, and were subsequently finally approved by the Board's Executive Officer in May 2009.

Attachment 3 provides a summary of the impact analysis contained in the 2008 FED. Each recommended measure that involved regulatory action by ARB was subject to the required Administrative Procedures Act (APA) rulemaking process, which includes preparation of a Staff Report: Initial Statement of Reasons (ISOR) containing the required EA for that regulatory proposal. The ISORs and the Final Statement of

Reasons (FSORs) for individual rulemaking can be found on ARB's webpage at http://www.arb.ca.gov/regact/regact.htm.

b) 2011 Supplement to 2008 FED – Alternatives Analysis

In June 2011, in response to a decision by a California state trial court, ARB revisited and expanded the alternatives analysis provided in the 2008 FED. The 2011 Supplement provided an expanded analysis of the five project alternatives discussed in section V of the 2008 FED, and superseded and replaced the project alternatives section of the 2008 FED found at pages J-74 to J-90. Following a workshop and 45-day comment period, staff responded to comments received in a document entitled *Response to Comments on the Supplement to the AB 32 Scoping Plan Functional Equivalent Document*. At a public hearing in August 2011, the Board considered and certified the combination of the 2011 Supplement, the written response to comments, and the prior environmental documents, after which it reconfirmed the approval of the initial Scoping Plan. Subsequently, the trial court dismissed that portion of the lawsuit on the grounds that ARB had fully satisfied the court's requirements for an expanded alternatives analysis.

3. Programmatic Analysis

This EA, like the prior environmental documents it builds upon, contains a programmatic level of environmental review. (See Cal. Code Regs., tit. 14, § 15168 "Program EIR.") The level of detail in this EA reflects that the project is a broad plan; consequently, the analysis does not provide the level of detail that will be provided in subsequent environmental documents prepared for specific regulatory actions that ARB or other agencies decide to pursue to reduce GHG emissions. (Cal. Code Regs., tit. 14, § 15152.)

This EA provides a good-faith effort to evaluate the potential for significant adverse impacts associated with the reasonably foreseeable compliance responses that appear most likely to occur as a result of implementing the recommended actions identified in each of the nine sectors discussed in the Proposed Update. The EA contains as much information as is currently available without being speculative. The scope of analysis is intended to help focus public review and to inform the public that questions and comments are appropriate and meaningful.

While the types of foreseeable compliance responses can be reasonably predicted, the specific location, design, and setting of the actions cannot feasibly be known at this time, and therefore, this EA can address only broadly defined types of impacts, rather than any specific project or location, potential facility, or site-specific environmental characteristics. Therefore, the programmatic impact analysis applies generally across a broad geography, rather than any particular site or project-specific locations. If a later activity would have environmental effects that are not examined within this EA, the public agency with authority over the later activity would need to conduct additional environmental review, as necessary.

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. Because the specific location, extent, and design of potential new and/or modified facilities 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., conservative in that the conclusions tend to overstate adverse effects). These impact discussions are followed by the types of mitigation measures that could typically be required to reduce potentially significant environmental impacts. This EA takes a conservative approach in finding some impacts to be potentially significant after mitigation because the authority to determine project-level impacts and require project-level mitigation lies with the land use and/or permitting agency for individual projects, and because the programmatic level of analysis associated with this 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. This conservative approach (i.e., tending to overstate environmental impacts) is intended to satisfy the good-faith, full-disclosure intent of CEQA.

It is expected that many of the impacts identified as potentially significant in this EA could be feasibly avoided or mitigated to a less-than-significant level during project-specific environmental review processes.

a) Beneficial Impacts

AB 32 establishes the objectives for GHG emission reduction activities in California. Section 38501(h) of AB 32 states:

> It is the intent of the Legislature that ARB design emission reduction measures to meet the Statewide emissions limits for GHGs established pursuant to this division in a manner that minimizes costs and maximizes benefits for California's economy, improves and modernizes California's energy infrastructure and maintains electric system reliability, maximizes additional environmental and economic co-benefits for California, and complements the State's efforts to improve air quality.

Although the primary focus of conventional CEQA impact assessment is identification and disclosure of adverse environmental impacts, California Code of Regulations, title 17, section 60005, subdivision (b) of ARB's certified regulatory program indicates:

> "All staff reports shall contain … an assessment of anticipated significant long or short term adverse and beneficial environmental impacts associated with the proposed action and a succinct analysis of those impacts."

Considering the legislative intent of AB 32, ARB's certified regulatory program, and the latitude under CEQA to recognize environmental co-benefits, this EA incorporates discussion of potential beneficial environmental impacts when those impacts are considered reasonably foreseeable and they are relevant to the decisions regarding the

Proposed Update. It is not possible to quantify these impacts because of the broad nature of this programmatic analysis. Potential beneficial impacts are described within the body of the text of the various impact sections.

4. Public Review Process for the EA

This Draft EA is being provided for a public review and comment period that starts on March 14, 2014 and ends on April 28, 2014. If comments received during the public review period raise significant environmental issues, staff will summarize and respond to the comments in writing. A final version of this EA, along with staff's written responses to comments on the Draft EA, will be considered by the Board at a public hearing scheduled for May 22, 2014. The Board will also consider approval of the Proposed Update at that public hearing. If the Proposed Update is approved, a Notice of Decision will be posted on ARB's website and filed with the Secretary for Natural Resources. (Cal. Code Regs., tit. 17, § 60007, subd. (b).) The Notice of Decision will also be filed with the State Clearinghouse.

5. Organization of the EA

The EA is organized into the following chapters to assist the reader in obtaining information about the Proposed Update and its specific environmental issues.

- **Chapter 1, Introduction and Background,** provides a project overview and background information, and other introductory material.
- **Chapter 2, Project Description,** summarizes the recommended actions identified in the Proposed Update, the potential reasonably foreseeable compliance responses, and implementation assumptions.
- **Chapter 3, Environmental and Regulatory Setting,** contains the environmental setting and regulatory framework relevant to the environmental analysis of the Proposed Update.
- **Chapter 4, Impact Analysis and Mitigation,** identifies the potential environmental impacts associated with the recommended actions identified in the Proposed Update and mitigation measures for each resource impact area.
- **Chapter 5, Cumulative and Growth-Inducing Impacts**, provides an overview of cumulative effects of implementing the recommended actions against a backdrop of past, present, and reasonably foreseeable future projects.
- **Chapter 6, Mandatory Findings of Significance**, discusses whether the recommended actions have the potential to degrade the quality of the environment, substantive adverse impacts on human beings, and 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 recommended actions.
- **Chapter 8, References,** identifies sources of information used in this EA.

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2.0 PROJECT DESCRIPTION

A. Overview of the Proposed First Update and Scope of the "Project" under CEQA

Assembly Bill 32 (AB 32) requires the Air Resources Board (ARB) to update the State's Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions of GHG emissions at least once every five years. (Health & Saf. Code § 38561, subd. (h).) The Proposed First Update to the Climate Change Scoping Plan (Proposed Update) describes progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities for the next several years.

The Proposed Update builds upon the framework established by the initial Scoping Plan and provides recommendations for the State to achieve its long-term climate objectives beyond 2020. Under the guidance of the Climate Action Team, ARB and other State agencies collaborated during the development of the Proposed Update to identify and describe a long-term vision and near-term recommended actions to put California on the path to its 2050 emission reduction goals.

The recommended actions in the Proposed Update have been developed to reduce GHG emissions from key sources and activities, while improving public health, promoting a cleaner environment, preserving natural resources, and ensuring, to the extent feasible, that the impacts of the reductions are equitable and do not disproportionately affect low-income and minority communities. The recommended actions are designed to contribute to further GHG emission reductions by 2020 and to continue the State's progress toward meeting the long-term 2050 goal of reducing California's GHG emissions to 80 percent below 1990 levels.

For the purposes of this Environmental Analysis (EA), ARB considers the recommended actions in the Proposed Update to be the "project" under 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. (Cal. Code Regs., tit. 14, § 15378.) Here, reasonably foreseeable compliance responses associated with implementation of the Proposed Update's recommended actions have the potential to result in either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

B. Project Objectives

The primary objectives of the Proposed Update are listed below. These objectives are derived from the requirements of AB 32 (Health & Saf. Code, § 38561) and for the adoption of GHG emission reduction measures (Health & Saf. Code, § 38562).

1. To update the State's Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions at least once every five years (Health & Saf. Code, § 38561, subd. (h));

2. Pursue measures to maintain and continue reductions in emissions of GHG beyond 2020 (Health & Saf. Code, § 38551, subd. (b));

3. Pursue measures that implement reduction strategies covering the State's GHG emissions in furtherance of California's mandate to reduce GHG emissions to 1990 levels by 2020;

4. Reduce fossil fuel use – to reduce California's reliance on fossil fuels and diversify energy sources while maintaining electric system reliability;

5. Design an enforceable, amendable program – to design a program that is enforceable and that is capable of being monitored and verified;

6. Ensure emission reductions – to pursue emission reductions that are real, permanent, quantifiable, verifiable and enforceable;

7. Achieve technologically feasible and cost-effective reductions – to achieve the maximum technologically feasible and cost-effective reductions in GHG emissions, in furtherance of achieving the statewide GHG emissions limit (Health & Saf. Code, §38562, subd. (a) and (c));

8. Avoid disproportionate impacts – to ensure, to the extent feasible, that activities undertaken to comply with the measures do not disproportionately impact low income communities (Health & Saf. Code, §38562, subd. (b)(2));

9. Complement existing air standards – to ensure, to the extent feasible, that activities undertaken pursuant to the measures complement, and do not interfere with, efforts to achieve and maintain national and California Air Quality Attainment Standards (AAQS) and to reduce toxic air contaminant (TAC) emissions (Health & Saf. Code, §38562, subd. (b)(4));

10. Consider a broad range of public benefits – to consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health (Health & Saf. Code, §38562, subd. (b)(6));

11. Minimize administrative burden – to minimize, to the extent feasible, the administrative burden of implementing and complying with the measure (Health & Saf. Code, §38562, subd. (b)(7));

12. Weigh relative emissions – to consider, to the extent feasible, the contribution of each source or category of sources to statewide emissions of GHGs (Health Saf. Code §38562, subd. (b)(9));

13. Maximize co-benefits – to maximize, to the extent feasible, additional environmental and economic benefits for California, as appropriate (Health & Saf. Code, §38570, subd. (b)(3)); and

14. Avoid duplication – to ensure that electricity and natural gas providers are not required to meet duplicative or inconsistent regulatory requirements (Health & Saf. Code, §§ 38501, subd. (g), 38561subd. (a)).

C. Description of Recommended Actions

The following section summarizes the recommended actions and the reasonably foreseeable compliance responses resulting from implementation of the recommended actions for each of the nine sectors discussed in the Proposed Update: energy, transportation, agriculture, water, waste management, natural and working lands, short-lived climate pollutants, green buildings, and the Cap-and-Trade Regulation. The focus is on those reasonably foreseeable compliance responses with potential to result in either a direct or reasonably foreseeable indirect physical change in the environment. Some compliance responses are actions that would not result in environmental effects (e.g., convening a research panel). Such recommended actions are noted and no environmental impacts are associated with their potential implementation. While the Proposed Update provides substantial information related to existing and past efforts, the EA focuses on recommended future actions.

1. Energy

a) Summary of Recommended Actions

The Proposed Update includes recommended actions to increase local energy generation and smart-grid technologies. To achieve this, ARB would work with other state agencies, including California Energy Commission (CEC) and California Public Utilities Commission (CPUC), to develop a program that could include: energy efficiency and demand response efforts, renewable energy development, power storage systems, smart-grid and microgrid deployment, and distribution and transmission system development and upgrades. Recommended actions for the Energy Sector are provided in Table 2-1.

Table 2-1 Key Recommended Actions for the Energy Sector
State agencies will develop comprehensive and enforceable GHG emission reduction requirements for the State's electric and energy utilities to achieve near-zero GHG emissions by 2050. Program development to be completed by end of 2016, and incorporate the following principles: • Thoroughly account for the carbon intensity and air quality impacts of various energy resources, generation technologies, and associated fuels. • Maximize local and regional benefits of energy facilities. • Minimize emissions of criteria air pollutants (CAPs) and toxic air pollutants (TACs).

Table 2-1 Key Recommended Actions for the Energy Sector
• Avoid disproportionate impacts to disadvantaged communities. • An enforceable program for all energy and electricity service providers. • Recordkeeping and reporting mechanisms to monitor and enforce the GHG emission reduction requirements. State's energy agencies pursue a series of key proceedings, including the following: • Develop criteria and rules for flexible demand response resources to participate in wholesale markets and integrate variable renewable resources, reducing the need for new flexible fossil generation. • Expand participation of regional balancing authorities in the California Independent System Operator (CAISO) Energy Imbalance Market and other potential methods of balancing authority cooperation, which provide low-cost, low-risk means of achieving real-time operational efficiency and flexibility needed for greater penetration of variable renewable resources, while ensuring support for GHG emission reduction programs. • Through the AB 758 process, CEC will develop a plan to encourage energy assessments—particularly when done at the time a building or unit is sold or by a predetermined date—as well as energy use disclosure requirements. • Enhance energy efficiency and demand response programs, and develop robust methodologies to monitor and evaluate the effectiveness of these programs. Methodologies developed by end of 2015 with the enhanced program proceedings completed by end of 2016. • A CPUC proceeding to continue to streamline state jurisdictional interconnection processes to create a ministerial low-cost interconnection process for distributed generation completed by the end of 2015. The CEC to explore similar streamlined processes for interconnecting distributed generation in publicly owned utility systems. The CPUC and CEC consult as appropriate with the CAISO as part of these proceedings. • To achieve the goals of the initial Scoping Plan and the Governor's objectives for Combined Heat and Power (CHP) to reduce GHG emissions, ARB to consult with the State's energy agencies to assess existing barriers to expanding the installation of CHP systems and propose solutions that help achieve climate goals. A future CHP measure could establish requirements for new or upgraded efficient CHP systems. • Evaluate the potential for carbon capture and sequestration (CCS) in the State to reduce emissions of CO_2 from energy and industrial sources. Working with the Division of Oil, Gas and Geothermal Resources (DOGGR), CEC and CPUC, ARB will consider a CCS quantification methodology for use in California by 2017.

b) Compliance Responses

Reasonably foreseeable compliance responses could range from small modifications to existing structures to utility-scale renewable energy projects. For instance, energy storage systems could be developed by modifying existing hydroelectric dams. Smart-grid technology includes installation of smart meters, which look similar to traditional energy meters and do not result in building modifications. Improvements to energy production, processing, storage, distribution, and transmission systems could be minimal, and consist of general housekeeping, vapor recovery valves, and frequent maintenance checks. In addition, to meet offset requirements, compliance responses may involve renewable energy project proposals. Renewable energy projects associated with these compliance actions could range from installation of solar panels and micro-turbines onto buildings (e.g., to create zero net energy [ZNE] buildings or CHP systems) to large-scale energy generation facilities, such as solar photovoltaic (PV) and wind turbine farms, and geothermal plants.

i) Energy Efficiency Programs

The Proposed Update includes the development of a comprehensive, enforceable GHG emission reduction requirement to reach near-zero GHG emissions for electric and energy utilities by 2050. Generally, the advanced energy efficiency applications and technologies include building design strategies and features that reduce demand-side loads, such as high-performance envelopes, air barrier systems, day-lighting, sun control and shading devices, careful selection of windows and glazing, passive solar heating, natural ventilation, and water conservation. Once the energy demand of buildings is reduced, loads could be managed with efficient equipment and systems.

The energy efficiency programs would be designed to maintain consistency with the State's broader energy policies, and include energy efficiency and demand-response efforts, renewable energy development, energy storage systems, smart-grid and microgrid deployment, and distribution and transmission system development and upgrades. Monitoring mechanisms would ensure reasonable progress is made in achieving mid-term and final GHG emission targets.

Reasonably foreseeable compliance responses that could be used to develop energy efficiency programs include: ZNE design standards for homes and businesses, demand-response programs, distributed renewable energy generation, CHP systems, energy storage technologies, smart grid and microgrid systems, and oil and gas production, processing, storage, distribution and transmission system upgrades.

ii) Zero-Net-Energy Homes and Businesses

ZNE generally refers to the design, construction, and operational practices that result in a building, or collective group of buildings, using no more energy over the course of a year than can be generated on-site through localized, distributed generating technology sources, such as solar panels, wind turbines, geothermal heat pumps, CHP systems, and fuel cells. This could be achieved by a combination of advanced energy efficiency applications and technologies to reduce overall energy demand, along with on-site, or nearby off-site in some cases, electricity generation to meet residual demand.

Combined with these advanced efficiency technologies, the remaining energy needs could be met using various on-site electricity generation technologies as noted above. Most ZNE buildings would still be connected to the electric utility grid, allowing for electricity procurement from traditional energy resources when on-site energy generation is not sufficient to meet a building's energy load. When on-site generation exceeds a building's energy requirements, surplus energy could be exported back to the utility grid with improvements in smart-grid technologies.

Reasonably foreseeable compliance responses could include changes to the design and construction specifications for new construction in California, or retrofits of existing buildings. This could potentially include increased demand, manufacturing, and production of more efficient heating, ventilation, and air conditioning (HVAC) systems, windows, doors, lighting, insulation, roofing, and other building materials and components, as well as on-site energy generating systems, such as solar panels, fuel cells, wind turbines, geothermal heat pumps, and other technologies. Increases in the installation, interconnection, operation and maintenance of such energy systems, either on-site or off-site, could potentially be required for all new construction. Design considerations for ZNE homes and buildings would be site specific, and could potentially require modifications to local building and zoning standards.

iii) Demand-Response

While developing demand-response as a renewable integration resource is a critical next step for the State, CPUC rulemaking also signals the importance of refining demand-response resources that cannot be bid into CAISO markets, but are beneficial to the State's goals of reducing energy consumption during peak hours. These resources, referred to as "load-modifying demand response," could reduce the State's demand curve over time through strategies, such as time-of-use rates and permanent load shifting programs. These programs could potentially reduce the need for gas-fired generation facilities in the future. Additionally, the rulemaking would explore how demand response could be better coupled with other demand-side resources, such as energy efficiency and distributed generation, so that retail customers see all their options and make well-informed decisions, thereby expanding demand-side resources collectively.

iv) Combined Heat and Power

CHP, also referred to as "cogeneration," generates on-site electricity and useful thermal energy simultaneously in a single, integrated system from a single fuel source, such as natural gas, biomass, and biogas). CHP systems may vary greatly in size, from less than 100 kilowatts (kW) to over 400 megawatts (MW) of generating capacity, and use a variety of operating technologies, including gas turbines, microturbines, reciprocating engines, fuel cells, and boilers. CHP technology is used in a wide variety of energy-intensive industries and facility types, including:

- **Industrial manufacturers** - chemical, refining, ethanol, pulp and paper, food processing, glass manufacturing
- **Institutions** - colleges and universities, hospitals, prisons, military bases

- **Commercial buildings** - hotels and casinos, airports, high-tech campuses, large office buildings, nursing homes
- **Municipal** - district energy systems, wastewater treatment facilities, K-12 schools
- **Residential** - multi-family housing, planned communities

Conventional power plants convert less than 50 percent of a fuel's energy to electricity with the balance lost as waste heat. By producing both electricity and usable heat, appropriately designed and sited CHP systems can convert as much as 90 percent of a fuel's energy into usable energy. Many industrial facilities require both electricity and thermal energy or heat for their operations. Facilities without CHP systems would typically purchase electricity from a centralized power plant and burn a separate fuel on-site to serve their thermal energy needs. Appropriately designed CHP systems could accomplish both of these needs more efficiently and cost-effectively, and reduce the need to develop new or expand existing power plants.

Reasonably foreseeable compliance responses could include increased construction and operation of new CHP facilities or retrofitting existing facilities with CHP systems. CHP facilities could range from smaller micro-scaled systems designed to serve smaller sites or buildings, to large facilities similar to a power plant designed for district-level or industrial applications.

v) Energy Storage

Energy storage technologies can provide an effective method of responding to daily fluctuations in demand. Energy produced at off-peak hours can be stored and used later to meet demand spikes, thereby reducing the need for fossil-fired reserve generation plants. Generally, four electricity storage technologies are considered to offer commercially viable options to meet potential demands: pumped hydroelectric, compressed air energy storage (CAES), batteries (NaS, Li-ion, Pb-acid), and flywheels.

These four types of electricity storage technologies could be reasonably foreseeable compliance responses. Pumped hydroelectric energy storage is a utility-scale technology, currently used at many locations world-wide. It employs off-peak electricity to pump water from a reservoir up to another reservoir at higher elevation. When electricity is needed, water is released from the upper reservoir through a hydroelectric turbine into the lower reservoir to generate electricity. A CAES system stores energy in the form of pressurized air, which is usually in underground caverns. Flywheel plants use electricity and convert electrical energy into kinetic energy with spinning discs, which can be sped up or slowed down to rapidly shift energy to or from the grid. Battery technologies are evolving and improving rapidly, leading to improved storage capacity and reduced cost. Currently, technologies under consideration include lithium-ion (Li-ion), sodium sulfur (NaS), and lead acid (Pb-acid) batteries.

Other technologies are under development and may become available in the near-future. These include superconductive magnetic energy storage, electrochemical capacitors, thermochemical energy storage, and hydrogen systems.

vi) Smart Grid and Microgrids

Smart-grid technology refers to computerizing the electric utility grid. It includes adding two-way digital communication technology to devices associated with the grid. Each device on the network can be given sensors to gather data (e.g., power meters, voltage sensors, fault detectors), plus two-way digital communication between the device in the field and the utility's network operations center. Smart grid allows for automation technology for which a utility can adjust and control each individual device or millions of devices from a central location.

Microgrids are autonomous electricity environments that operate within a larger utility grid. They can integrate power from small, distributed facilities, such as rooftop solar installations, into the grid.

vii) Oil and Gas Production, Processing, Storage, Distribution and Transmission System Upgrades

ARB could develop a regulation to control fugitive methane (CH_4) and carbon dioxide (CO_2) emissions from oil and gas production, processing, and storage tanks.

The reasonably foreseeable compliance responses that could occur under new regulations include the installation of vapor recovery equipment, implementation of best management practices related to general housekeeping (e.g., keeping storage tanks hatches closed), capture and return of gas to production lines, increased maintenance activities to replace leaking compressor seals and other components more frequently, and other potential recommendations to prevent fugitive GHG emissions. Most of these activities would occur within the footprints of existing oil and gas field operations. However, minor expansions of existing facility footprints could potentially occur as a result of a new regulation, depending on the range and site-specific application of recommendations employed to reduce emissions.

In addition, reasonably foreseeable compliance responses could include increased inspection and maintenance to reduce leaks at pipeline joints and fittings, and replacement of compression and metering stations pneumatic valves with no- or low-bleed valves. These activities would be anticipated to occur largely within the footprint of existing facilities, and in conjunction with regular inspection, maintenance or replacement of existing infrastructure. Any excavation or pipeline replacement that could occur would be similar to, or within the scope of, normal system maintenance or replacement activities.

viii) Carbon Capture and Sequestration

The Proposed Update includes a recommended action in the Energy Sector to develop a CCS quantification methodology by 2017. The Cap-and-Trade Regulation currently acknowledges the potential for GHG emission reductions from CCS, and states that covered entities may reduce their compliance obligations for each metric ton of CO2 that has been proven to be sequestered using a Board-approved CCS quantification methodology. Also, reasonably foreseeable compliance responses under LCFS could

include the deployment of CCS. A quantification methodology has not yet been adopted. (See also the Transportation and Cap-and-Trade Regulation sections in this chapter).

CCS is a process whereby CO_2 emissions are captured from large industrial sources, such as power plants, natural gas processing facilities, fertilizer plants, ethanol plants, and hydrogen plants, and are then transported and injected into underground geological formations, such as depleted oil and gas fields, or deep saline aquifers. The injection is designed to prevent the captured CO_2 from being released into the atmosphere. In some cases, enhanced oil recovery (EOR) has been proposed in conjunction with CCS projects in existing oil fields. EOR involves the injection of gaseous CO_2 into a formation to push additional oil to a production wellbore and, under the right conditions, improve oil viscosity and flow rate.

Reasonably foreseeable compliance responses associated with approval of the CCS quantification methodology could include the development and construction of CCS projects. These projects could include the modification of existing or new industrial facilities to capture CO_2 emissions, along with construction of new infrastructure such as pipelines, wells, and other surface facilities in various locations to enable the transport and injection of CO_2 into a geological formation for sequestration. The transport distances and pipeline construction requirements for the captured CO_2 would vary considerably, depending on the locations of specific industrial sources of the captured CO_2 and proposed underground formations.

2. Transportation: Vehicles/Equipment, Sustainable Communities, Housing, Fuels, and Infrastructure

a) Summary of Recommended Actions

The major types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero-emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement sustainable communities to reduce vehicular GHG emissions and provide more transportation options; and (4) improve the efficiency and throughput of existing transportation systems. Recommended actions for the Transportation Sector are provided in Table 2-2.

Table 2-2 Key Recommended Actions for the Transportation Sector
Vehicle Technology • The 2017 mid-term review for Advanced Clean Cars, where ARB, U.S. Environmental Protection Agency (US EPA), and the National Highway Traffic Safety Administration (NHTSA) will conduct a technical assessment of vehicle technology trends, will inform future light-duty vehicle standards targeted at continuing to achieve GHG reductions of about 5 percent per year through at least 2030. • In 2016, ARB will propose rules and/or incentives, including the “Phase 2” heavy-duty vehicle GHG standards in conjunction with US EPA and NHTSA with a goal of achieving new vehicle GHG emission reductions of at least 5 percent per year.

Table 2-2 Key Recommended Actions for the Transportation Sector

- For completion by 2017, ARB will engage the Office of Planning and Research (OPR) and other stakeholders to expand upon the 2013 Zero-Emission Vehicle (ZEV) Action Plan for medium- and heavy-duty ZEVs.

Fuels

- In 2014, ARB will propose enhancements to strengthen the Low Carbon Fuel Standard (LCFS). ARB will also consider extending the LCFS beyond 2020 with more aggressive long-term targets, such as a 15 to 20 percent reduction in average carbon intensity, below 2010 levels, by 2030.
- By 2018, the CPUC, CEC, California Department of Food and Agriculture (CDFA), and ARB will evaluate and adopt the necessary regulations and/or policies to further support commercial markets for low-carbon transportation fuels, including but not limited to:
    - Reducing off-peak demand charges for electricity and plug-in vehicle charging rates that strongly encourage off-peak charging both at home and at public chargers;
    - Development of large-scale renewable and low-carbon production facilities through continued funding for infrastructure;
    - Development and adoption of performance and quality standards;
    - Streamlined local permitting and siting for hydrogen fueling and charging infrastructure and utility interconnection for charging infrastructure; and Research.

Transportation, Land Use, and Housing

- In 2014, ARB will complete a technical review that will inform the need for and appropriate timing of revisions to the SB 375 regional targets established in 2010 for Sustainable Communities Strategies (SCS) being adopted and implemented by 18 Metropolitan Planning Organizations (MPO).
- The High-Speed Rail (HSR) Authority will work with other rail and mass transit providers to increase transit ridership both regionally and inter-regionally.
- The HSR Authority will continue construction of the HSR system, beginning with completion of all station-area planning by 2017 followed by completion of the initial operating segment in 2022. By 2029, HSR is scheduled to be completed between San Francisco and Los Angeles.
- ARB, the California Department of Transportation (Caltrans), the California Strategic Growth Council (SGC), and the California Department of Housing and Community Development (HCD), along with other State, local, and regional agencies, will coordinate planning and support to ensure that the expected GHG emission reductions from approved SCS are achieved or exceeded.

Sustainable Freight Strategy

- In 2014, ARB will complete the first phase of the Sustainable Freight Strategy, which will identify and prioritize actions through at least 2020 to move California towards a

Table 2-2 Key Recommended Actions for the Transportation Sector

sustainable freight system. This strategy will be informed by technology assessments in all the major freight transport categories, including: trucks, trains, ocean-going vessels, commercial harbor craft, cargo-handling equipment, fuels, and air cargo/airports

Investments

- Leverage available public money to scale-up clean technology markets and strategies and ensure necessary infrastructure investments, including the following:
  - ARB, CEC, CPUC, and CDFA will support growing markets for clean passenger transportation, advanced-technology trucks and equipment, and low-carbon transportation fuels and energy, including any necessary infrastructure.
  - Caltrans, working with local and regional agencies, will consider lifecycle benefits and impacts (including environmental, construction, operation, and maintenance costs) for transportation infrastructure projects.
  - Caltrans and regional transportation agencies will increase investment in expanded transit and rail services, active transportation, and other vehicle miles traveled (VMT)-reduction strategies in their next regional transportation plans.
  - SGC will support SCS implementation, including, for example, integration of the regional transportation and Regional Housing Needs Allocation planning, as well as provision of local assistance for transit, active transportation, and affordable transit-oriented housing development; therefore, offering more efficient consumer choices.
- State agencies, including ARB and Caltrans, will incorporate into ongoing GHG planning efforts strategies that help achieve significant reductions in oxides of nitrogen (NO_X) by 2032 to meet the national ambient air quality standards (AAQS) for ozone. The 2016 State Implementation Plans (SIPs) will outline attainment strategies through 2032.

b) Compliance Responses

There are four main types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero-emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and develop communities that would minimize vehicular GHG emissions and provide more transportation options; and (4) improve the efficiency and throughput of existing transportation systems. These actions could result in the reasonably foreseeable compliance responses of an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or low- and zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards.

Infrastructure to support clean vehicles could be required, such as charging infrastructure and alternative fueling stations.

Additionally, when the development of a CCS quantification methodology is completed and approved, reasonably foreseeable compliance responses under the LCFS could include the deployment of CCS projects (see the Energy Sector section of this chapter for a detailed description of the recommended action and reasonably foreseeable compliance responses for CCS methodology development).

i) Vehicle Technology and Equipment

(a) Phase 2 Heavy-Duty Vehicle GHG Standards

The Proposed Update includes development of a measure that implements Phase 2 of the Heavy-Duty Vehicle GHG Emission Reduction Regulation. Phase 2 would establish more stringent GHG emission reduction requirements for medium- and heavy-duty vehicles and engines, and may include new national GHG emission reduction requirements for trailers. This measure would be developed in concert with the US EPA and NHTSA. Phase 2 of the regulation could be considered for approval by 2017.

Reasonably foreseeable compliance responses could include increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission heavy duty vehicle technologies including, but not limited to, standard hybrid vehicles, plug-in hybrid electric vehicles, battery-electric vehicles, fuel-cell vehicles, or other zero-emission vehicle technologies; and potential changes in the design and manufacturing of heavy duty trailers.

(b) Zero-Emission Vehicles

The initial Scoping Plan recommended the ZEV program. In September 2013, ARB released proposed amendments to the ZEV regulation that would adjust the optional Section 177 State compliance path provision, define how caps apply to a manufacturer's requirements, and disallows battery swapping to qualify under the fast refueling definition for Type IV and V ZEVs. The 2013 ZEV Action Plan was developed in response to Governor Brown's Executive Order (EO) B-16-2012 (March 23, 2012). EO B-16-2012 sets a long-term target of reaching 1.5 million ZEVs on California's roadways by 2025. The Proposed Update includes the development of actions that are designed to encourage the use of clean-vehicle technology. Reasonably foreseeable compliance responses could lead to an increase in the zero-emission vehicle market, and increase manufacturing of hydrogen fuel cells, plug-in hybrids, and battery-electric vehicles. New facilities may be required to meet the increased demand.

ii) Transportation, Land Use, and Housing

In compliance with Senate Bill (SB) 375, Statutes of 2008, each of California's MPOs must prepare and adopt an SCS as an integral part of its Regional Transportation Plan (RTP). The SCS contains land use, housing, and transportation strategies that would allow the region to meet GHG emission reduction targets established by ARB. Once adopted by the MPO, the RTP/SCS guides the transportation policies and investments

for the region and land use planning for cities and counties in the region. Generally, GHG reduction is achieved in an SCS through increased housing density, greater access to alternative forms of transportation, and mixed-use development with the goal of reducing VMT by cars and light trucks. ARB must review the adopted SCS andaccept or reject the MPO's determination that the SCS, if implemented, would achieve the regional GHG targets. The Proposed Update includes a review of the GHG reduction targets to evaluate the need to revise targets to continue to meet State goals.

iii) High Speed Rail System

The HSR system is part of the statewide strategy to provide more mobility choices and reduce GHG emissions. This Proposed Update supports the continued implementation of plans to construct and operate a HSR system between northern and southern California. As planned, the HSR is a 700-mile-long rail system capable of speeds in excess of 200 miles per hour on dedicated, fully grade separated tracks with state of the art safety, signaling and automated rail control systems.

The Proposed Update continues to support implementation of the HSR. The HSR Authority is planning to coordinate with other rail and mass transit providers to increase transit ridership both regionally and inter-regionally. HSR is scheduled to be completed from San Francisco to Los Angeles by 2029.

iv) Sustainable Freight Strategy

ARB is currently developing the first phase of the Sustainable Freight Strategy. This program is designed to comprehensively address the freight system and identify actionable next steps over a five- to seven-year period. This strategy would identify near-term actions resulting from technology and infrastructure assessments of each of the freight sectors, including principles and criteria for transportation infrastructure projects, and determine technology gaps, research needs, and necessary funding requirements. Reasonably foreseeable compliance responses could include increases in zero- and near-zero-emission trucks, zero-emission rail transport, and the use of cleaner fuels. In addition, recommendations could require that all containers transported between the marine port and the near-dock railyards use on-road, zero-emission vehicle technologies and/or fixed-guideway systems that do not create emissions from container transport.

Assessments would draw from technology expertise in the public and private sector and would lay the framework for identifying and prioritizing the next steps, including accessing and leveraging funding, near-term implementation strategies, and longer-term actions that could be included as measures in upcoming SIPs.

v) Investments

The Proposed Update includes advanced technology freight demonstration projects and pilot deployments of advanced heavy-duty vehicles and equipment in a variety of vocations. Reasonably foreseeable compliance responses could include: zero emission port trucks for near-dock rail pilot projects; pilot projects to deploy zero-emission and hybrid vehicles and equipment (e.g., charging stations) at distribution centers located in

areas most affected by air pollution; and development and demonstration of advanced technology locomotives, marine vessels, and cargo-handling equipment.

Investment throughout California in projects that modernize the passenger rail system and link seamlessly to local public transit systems could continue to build public transit ridership and shift travelers from single-occupancy vehicles to public transport. Rail modernization infrastructure investments would be coordinated with local and regional planning to be mutually supportive. As part of the early development of HSR, commuter, and urban rail systems are being upgraded and expanded to provide connectivity to the future HSR system.

Furthermore, ongoing investments could be distributed to local communities to plan and implement sustainable community development, including integrated public transit and HSR, Clean Vehicle Rebate Projects, Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, Zero-Emission Bus Transit Centers, and passenger and freight transportation infrastructure needs. Active transportation and public transit alternatives are increasingly in demand and are necessary to meet ongoing emission reduction targets. Caltrans, working with local and regional agencies, would coordinate local, State, and federal funding for transportation infrastructure (including construction, operation, and maintenance costs) and consider lifecycle benefits and impacts (including environmental, construction, operation, and maintenance costs) for transportation infrastructure projects.

3. Agriculture

a) Summary of Recommended Actions

The types of recommended actions for the Agriculture Sector involve GHG emission reduction and carbon sequestration opportunities. Due to limited research, and the wide variety of farm sizes, animals, and crops produced, there are few generally applicable, emission reduction or carbon sequestration strategies. Farm management practices could include: nitrogen management, such as the use of nitrification inhibitors or fertigation (i.e., application of nutrients through irrigation systems); CH_4 capture from manure; and soil management practices, including changing tilling practices or cropping patterns. In addition, precision irrigation; using the cleanest, most-efficient, and well-maintained equipment; and locally generated biofuels could reduce fuel use. In addition to management modifications on agricultural lands, local and regional land use planning could be used to incentivize conservation easements, urban growth boundaries, and maintenance of agricultural zoning. Other planning efforts may include recommendations from the Bioenergy Action Plan that addresses economic, infrastructure, and regulatory limitations associated with the use of digester biogas in natural gas pipelines and bioenergy-generated power in the electric grid. Recommended actions for the Agriculture Sector are provided in Table 2-3.

Table 2-3 Key Recommended Actions for the Agriculture Sector

• In 2014, convene an interagency workgroup that includes CDFA, ARB, CEC, CPUC, and other appropriate State and local agencies and agriculture stakeholders to:
  ▪ Establish agriculture sector GHG emission reduction planning targets for the mid-term time frame and 2050.
  ▪ Expand existing calculators and tools, to develop a California-specific agricultural GHG tool for agriculture facility operators to use to estimate GHG emissions and sequestration potential from all on-farm sources. The tool would include a suite of agricultural GHG emission reduction and carbon sequestration practices and would allow users to run different scenarios to determine the best approach for achieving on-farm reductions.
  ▪ Make recommendations on strategies to reduce GHG emissions associated with the energy needed to deliver water used in agriculture based on the evaluation of existing reporting requirements and data.
• The Dairy Digester Workgroup will develop recommendations for a CH_4 capture standard by 2016.
• Conduct research that identifies and quantifies the GHG emission reduction benefits of highly efficient farming practices, and provide incentives for farmers and ranchers to employ those practices.
• By 2017, evaluate the data reported to the Regional Water Quality Control Board's (RWQCB's) Long Term Irrigated Lands Regulatory Programs to determine if the reported fertilizer data are adequate to establish a robust statewide GHG nitrous oxide (N_2O) inventory for fertilizer used in agriculture. If existing data are not adequate to develop an inventory, then develop a mechanism to collect the necessary data.
• In 2015, OPR, the California Natural Resources Agency (CNRA), the California Environmental Protection Agency (CalEPA), CDFA, and ARB will convene an inter-agency workgroup to engage local and regional land use planning agencies in establishing a coordinated local or State land use program to develop recommendations and targets for incorporating farmland conservation in local and regional land use planning.
• CDFA will strengthen technical assistance programs and associated financial incentives to help agricultural operators develop carbon plans and implement GHG emission reduction practices.
• In 2015, the Bioenergy Interagency Working Group will strengthen, refine, and implement actions contained in its Bioenergy Action Plan to promote the input of digester biogas into natural gas pipelines and bioenergy onto the electric grid.

b) Compliance Responses

Reasonably foreseeable compliance responses associated with the agriculture sector recommendations consist of nitrogen management, manure management, soil

management practices, water and fuel technologies, and land use planning to enhance, protect, and conserve lands in California. These are described as follows.

i) Nitrogen Management

Nitrogen fertilizers applied to crops release N_2O, a significant source of agricultural GHG emissions. The current GHG emissions inventory lacks specificity and detail about the use of fertilizers in California agriculture. Obtaining more specific data on statewide fertilizer use in agriculture and nitrogen deposition on land would assist ARB with determining baseline emissions, thereby improving the GHG inventory. This information would also help guide the development of potential GHG emission reduction measures. Existing nitrogen tonnage reports and new reporting requirements under development by the RWQCB could be used to improve the existing GHG N_2O inventory for fertilizer. Further examination of these data would help determine if broader statewide fertilizer use reporting is needed.

Compliance Responses that could be employed include the use of nitrification inhibitors, fertigation (the application of fertilizer through irrigation systems), and other approaches. However, additional research is needed to evaluate the potential for GHG emission reductions.

ii) Manure Management

Livestock manure is a significant source of CH_4, and approximately half of the CH_4 generated from livestock comes from manure storage lagoons. Reasonably foreseeable compliance responses could include covering the lagoons and to allow for capture and use of CH_4 to produce energy or renewable fuel (e.g., with the use of a digester).

iii) Soil Management Practices

Historically, tilling (loosening and turning) of soil has been a fundamental agricultural practice to suppress weeds and loosen compacted clay soils. However, tillage releases large quantities of CO_2 and N_2O from the soil into the atmosphere. Compliance responses associated with soil management practices could include changing tillage methods and cropping patterns, which could also result in reduced fuel consumption by farm equipment, providing additional permanent reductions in GHG emissions, including short-lived climate pollutants.

iv) Water and Fuel Use

Compliance responses to reduce water and fuel use could include technologically advanced tools, such as remote irrigation systems, precision irrigation to crops, and using the cleanest, most-efficient, and well-maintained equipment for agricultural operations. In addition, fuels could be derived from plant matter (biofuels) and used onsite and at nearby production facilities, which could displace fossil fuel use.

v) Land Use Planning to Enhance, Protect, and Conserve Lands in California

Conservation of agricultural lands could be used to meet long-term climate goals. This could be accomplished through development of SCSs, including reducing VMT.

Reasonably foreseeable compliance responses could include incentives for conservation easements, supporting urban growth boundaries, and maintaining agricultural zoning. In addition, local and regional land use planning actions and policies could more fully integrate and emphasize land conservation and avoided conversion of croplands, forests, rangelands, and wetlands, as well as expansion and promotion of urban forestry and green infrastructure.

4. Water

a) Summary of Recommended Actions

The Proposed Update includes three types of recommended actions to reduce water-related energy use: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less-energy intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes such as water rights applications. Recommended actions for the Water Sector are provided in Table 2-4.

Table 2-4 Key Recommended Actions for the Water Sector
Funding • California Department of Water Resources (DWR) and State Water Resources Control Board (SWRCB) will give priority to funding integrated management plans that include robust existing or proposed water and energy conservation and efficiency and measures that achieve GHG emission reductions. Conservation programs must include numeric targets. *Technology* • CEC will implement new water-related energy conservation measures and efficiency standards. • CPUC will complete water-energy nexus rulemaking by 2016 and to continue implementation of joint water-energy utility efficiency programs and partnerships • SWRCB and CPUC will incent resource-recovering wastewater treatment projects by 2015. • SWRCB and RWQCB by 2016 will implement green infrastructure permits to treat and capture urban runoff for local use. *Administration* • As directed by the California Water Action Plan, the DWR, the SWRCB, CPUC, CEC, CDFA, and ARB will guide adoption of GHG emission-reducing policies for water sector investments and action by 2015. Conservation measures and regulations to reduce GHG emissions and maintain water supply reliability during drought periods will be a centerpiece of this administration action. • As directed by the California Water Action Plan, DWR, SWRCB, CPUC in consultation with the CDFA, will identify and incent implementation of rate structures

Table 2-4 Key Recommended Actions for the Water Sector
that accurately reflect the economic, social, and environmental value of water in California while maintaining affordability for basic services. • As directed by the California Water Action Plan, SWRCB will develop a comprehensive groundwater management strategy, and the DWR and CDFA to provide technical and financial assistance to exceed SBx7-7 targets. • SWRCB and RWQCBs by 2016 will modify State and regional water board policies and permits to achieve conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. *Education* • As directed by the California Water Action Plan, DWR, SWRCB, CPUC, CEC, and CAISO will promote water-energy conservation outreach and education.

b) Compliance Responses

The Proposed Update includes actions from the California Water Action Plan, including conservation measures and regulations, incentivizing rate structures, and a groundwater management strategy. New policy development would require balancing multiple objectives (e.g., flood protection, sustainable food production, and renewable energy development). Coordination between multiple state agencies would be required to ensure that efficient and aligned policy objectives are met for applicable agencies, including: CEC, CDFA, CPUC, CAISO, SWRCB, and RWQCB.

Reasonably foreseeable compliance responses primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur.

5. Waste Management

a) Summary of Recommended Actions

Under the Proposed Update, programs would be developed to eliminate disposal of organic materials at landfills. Options could include: legislation, direct regulation, and inclusion of landfills in Cap-and-Trade. Infrastructure development would require identification of financing, funding, and incentive mechanisms, which may include Cap and Trade Investment Plan; loan, grant, payment programs; LCFS pathways; CPUC (biogas from anaerobic digestion, Renewable Market Adjusting Tariff); and offset protocols for recycling, composting, and anaerobic digestion. The California Department of Resources, Recycling, and Recovery (CalRecycle) and Department of General

Services (DGS) would take the lead in improving the State procurement of recycled-content materials through the State Agency Buy Recycled Campaign reform. Recommended improvements would need to be identified, and a plan developed, for implementing the identified improvements.

In addition, the Landfill Methane Regulation may be amended to include additional CH_4 controls at new and existing landfills, increases in the use of captured CH_4 for waste as a fuel source for stationary and mobile applications. Recommended actions for the Waste Management Sector are provided in Table 2-5.

Table 2-5 Key Recommended Actions for the Waste Management Sector
• ARB and CalRecycle will lead the development of program(s) to eliminate disposal of organic materials at landfills. Options to be evaluated will include: legislation, direct regulation, and inclusion of landfills in the Cap-and-Trade Regulation. If legislation requiring businesses that generate organic waste to arrange for recycling services is not enacted in 2014, then ARB, in concert with CalRecycle, will initiate regulatory action(s) to prohibit/phase out landfilling of organic materials with the goal of requiring initial compliance actions in 2016. • ARB and CalRecycle will identify and execute financing/funding/incentive mechanisms for in-State infrastructure development to support the Waste Management Sector goals. Mechanisms to be considered will include the Cap-and-Trade Investment Plan; loan, grant, and payment programs; LCFS pathways; CPUC proceedings (e.g. biogas from anaerobic digestion and Renewable Market Adjusting Tariff); and offset protocols for recycling, composting, anaerobic digestion, and biomass. • ARB will lead a process of identifying and recommending actions to address cross-California agency and federal permitting and siting challenges associated with composting and anaerobic digestion. As the first step, ARB convened a working group in 2013 made up of representatives from CalRecycle, SWRCB, and local air districts to identify challenges and potential solutions. A working group report will be released in mid-2014. • ARB will explore and identify opportunities for additional CH_4 control at new and existing landfills, and increase the utilization of captured CH_4 for waste already in place as a fuel source for stationary and mobile applications. If determined appropriate, amend the Landfill Methane Regulation and/or move landfills into the Cap-and-Trade Regulation (2016/17). • ARB and CalRecycle will develop new emission reduction factors to estimate GHG emissions reduction potential for various recycling and remanufacturing strategies. To the extent that data are available, these factors will include upstream and downstream emissions impacts. • CalRecycle and DGS will need to take the lead in improving the State procurement of recycled-content materials through the State Agency Buy Recycled Campaign reform. Recommended improvements need to be identified by 2014, along with a plan for implementing the identified improvements.

b) Compliance Responses

Implementation of the recommended actions in the Waste Management sector would be reasonably expected to result in construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling, development of biomass facilities, and anaerobic digestion facilities. In addition, reasonably foreseeable compliance responses may include installation of CH_4 control devices at existing landfills. While some of these activities could occur within existing landfills, construction of new facilities may be necessary to accommodate increased demand of organic waste diversion.

i) Anaerobic Digestion

Anaerobic digestion is the biological decomposition of organic matter with little or no oxygen. The anaerobic digestion process occurs naturally in marshes and wetlands. There are a variety of controlled systems where anaerobic technology is currently used in the United States including wastewater treatment facilities and dairy manure digesters. In other countries (primarily Europe), anaerobic technology is used in municipal solid waste digesters to produce energy and to reduce the volume of solid waste that must be landfilled.

Anaerobic digester facilities that process solid waste produce biogas and digestate (liquids and solids). The biogas consists primarily of CH_4, which can be used for energy, and CO_2, with small amounts of hydrogen sulfide (H_2S), and ammonia (NH_3). Typically, biogas is saturated with water vapor and may have trace amounts of hydrogen (H_2), nitrogen (N_2), oxygen (O_2), dust and siloxanes. Residual products from anaerobic digestion are liquid and solid residuals (digestate) (CalRecyle 2010).

ii) Methane Control at Landfills

Landfill gas is produced naturally by the aerobic (with air) and anaerobic (without air) decomposition of organic waste in MSW landfills. MSW is compacted and buried and the buried wastes decompose over time. Because the waste is insulated from outside air, anaerobic decomposition produces large quantities of CH_4. In general, landfill operators are required to provide a daily cover of soil or other approved material over the waste that is received by the landfill to prevent odors and other nuisances.

Landfill gas typically consists of CH_4 and CO_2, with trace levels of non-methane organic compounds (NMOC). NMOCs include volatile organic compounds (VOC), toxic air contaminants (TACs), and odorous compounds.

CH_4 emissions from MSW landfills are controlled by first containing the gas by using soil, compacted clay, geomembrane, biocovers, or other surface covers, and then capturing the gas through the installation and operation of gas collection and control systems. These systems consist most commonly of vertical wells and in some cases horizontal trenches that are buried within the waste and connected to header pipes which route the gas to a pump or blower station. Vacuum applied to the wells by a pump or blower draws the gas to a control device (e.g., flare, internal combustion engine,

boiler, gas turbine, or microturbine). The collected gas can either be combusted, used to produce energy, or purified for offsite use (ARB 2009).

6. Natural and Working Lands

a) Summary of Recommended Actions

The Proposed Update includes addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts would be aimed at urban, natural and working lands, and agricultural croplands within and across jurisdictions, which all should be considered to create interconnected land areas and ecosystems. Recommended actions for the Natural and Working Lands Sector are provided in Table 2-6.

Table 2-6 Key Recommended Actions for the Natural and Working Lands Sector
• The California Natural Resources Agency (CNRA) and CalEPA will convene an inter-agency forest climate workgroup to prepare and publish a "Forest Carbon Plan" in 2016. The Forest Carbon Plan will: ▪ Set quantitative mid-term and long-term planning targets to ensure an increase in net forest carbon storage in California commensurate with the State's long-term GHG reduction goals, and in light of recent research that suggest that forests in California may be a source of GHG emissions rather than a carbon sink. ▪ Identify near-term and long-term actions necessary to meet quantitative planning targets while ensuring forest resilience and health, ecosystem services, conservation of the forest land base, and continued economic opportunities. ▪ Evaluate GHG emission and carbon sequestration trends for different forest land ownership types and consider sector sub-targets for each type. ▪ Develop specific recommendations regarding approaches for funding actions to ensure that forests in California provide net long-term carbon storage. • In 2016, through AB 1504, the California Department of Forestry and Fire Protection (CalFIRE) and the Board of Forestry and Fire Protection (BOF) will evaluate methods to develop a life cycle analysis to track carbon in wood products; this work should be coordinated with ARB's forest inventory and support the Forest Carbon Plan. • The Bioenergy Interagency Working Group will continue work with stakeholders and relevant agencies to strengthen, refine, and implement actions contained in its Bioenergy Action Plan related to use of forest biomass. • In 2015, OPR, CNRA, CalEPA, CDFA, and ARB will convene an inter-agency workgroup to engage local and regional land use planning agencies in establishing a coordinated local land use program. The program will set planning targets that identify, prioritize, and incentivize land conservation; increase urban forest canopy cover; bolster development of green infrastructure; and limit the conversion of both agricultural croplands and natural and working lands. • In 2015, CNRA, CalEPA, CDFA, and ARB will convene a natural and working lands

Table 2-6 Key Recommended Actions for the Natural and Working Lands Sector
climate investment working group to draft a report outlining funding needs, opportunities, and priorities for the natural and working lands sector. • Expand urban forestry and green infrastructure programs and investments, particularly in California's environmental justice communities. • Continue to invest in and expand monitoring and research to fill data gaps in California's inventory, particularly with respect to carbon stocks and flux in rangelands and wetlands. Forest inventory data also require refinement and may include research on forest soil carbon.

b) Compliance Responses

Reasonably foreseeable compliance responses would involve coordination between state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally aim to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (e.g., growing media and vegetation) roofs.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. This could be accomplished through increased use of biomass facilities.

i) Forest Carbon Plan

The Forest Carbon Plan would include mid-term and long-term planning targets; identify actions to meet those targets; and provide recommendations on funding those actions. The Forest Carbon Plan would consider a review of Forest Practice Regulations and recommendations for best management practices and potential additional regulatory measures or amendments needed to minimize GHG emissions and enhance carbon storage associated with silvicultural treatments (practice of controlling the establishment, growth, composition, health, and quality of forests to meet diverse needs and values). For example, a requirement for Sustained Yield Plans to demonstrate that activities not only maintain the current level of carbon sequestration, but actually increase carbon sequestration over the 100-year planning horizon.

(a) <u>Wood Product Carbon Life Cycle Research</u>

Development of a carbon life cycle analysis for wood products could also be considered. When utilizing wood products for construction, manufacturing, and sale of goods in California, the location of the initial raw wood should be considered along with an analysis of the associated carbon emissions from the processing and transport of wood products through the various steps of the supply chain. Guidelines could be established that identify and incentivize wood products that reduce carbon emissions–taking into account GHG emissions from transportation to the mill, from the mill to the

production facility, and finally to the retailer. For example, wood harvested in California and transported and used locally for construction and manufacturing would have a lower carbon impact than wood that has been harvested and manufactured outside the State, shipped from overseas, or processed and reintroduced within California as a finished wood product.

ii) Land Use Planning to Enhance, Protect, and Conserve Lands in California

As described under the Agricultural Sector, an integrated and coordinated approach to local or State land use planning that considers all land types is important in meeting the State's GHG reduction goals. Urban, natural, and working lands and agricultural croplands within and across jurisdictions may all serve as interconnections between habitats and ecosystems. Local and regional land use planning actions and policies need to more fully integrate and emphasize land conservation and avoided conversion of croplands, forests, rangelands, and wetlands—as well as expand and promote urban forestry and green infrastructure. In addition, land use planning could include increased installation and maintenance of urban forests.

7. Short-Lived Climate Pollutants

a) Summary of Recommended Actions

The term "ozone depleting substances" (ODS) refers to a large group of chemicals known to destroy the stratospheric ozone layer when released into the atmosphere. ODS were historically used in a wide variety of applications, including refrigerants, foam blowing agents, solvents, and fire suppressants. In addition to their potency as ozone depleting substances, the ODS addressed by this protocol also exhibit high global warming potentials (GWP). The GWP of these ODS range from several hundred to several thousand times that of CO_2.

Four general concepts are associated with the Short-Lived Climate Pollutants Sector within the Proposed Update: high-GWP fluorinated gas (F-gas) phasedown, low-GWP requirements, ODS recovery and destruction, and high-GWP fees. Recommended actions for Short-Lived Climate Pollutants are provided in Table 2-7.

Table 2-7 Key Recommended Actions for Short-Lived Climate Pollutants
• Develop a comprehensive strategy for mitigation of short-lived climate pollutants by 2015. • Continue diesel controls that will reduce black carbon emissions by 95 percent from the late 1960s to 2020. • Reduce emissions of smog-forming pollutants by about 90 percent below 2010 levels by 2032 to meet the national AAQS for ozone. • Create a collaborative agreement with the US EPA to establish national standards in alignment with the European Union (EU) proposed F-gas phasedown of hydrofluorocarbon (HFC) production and importation to 21 percent (by CO_2e) of baseline annual usage (years 2008-2011) by the year 2030.

Table 2-7 Key Recommended Actions for Short-Lived Climate Pollutants
• Require low-GWP gases where feasible and cost-effective. • Incentivize recovery and destruction of ODSs at the end-of-life by a combination of strategies, including adjustments to current ODS destruction protocols, and/or implementing a mitigation fee. • Set an upstream mitigation fee on sales of high-GWP gases and sales or import of equipment pre-charged with high-GWP gases.

b) Compliance Responses

Reasonably foreseeable compliance responses would result in replacement of high-GWP compounds with low-GWP compounds. This could affect commercial refrigeration and air conditioning, transport refrigeration, aerosol propellant metered dose inhalers, solvents, fire suppressants, sulfur hexafluoride uses, and structural pesticide fumigants. Use of these replacement compounds, and related equipment, could result in the construction of new manufacturing facilities or modification of existing manufacturing facilities.

ODS recovery and destruction and replacement of high-GWP compounds with low-GWP compounds could be incentivized through mitigation fee programs. These incentives could increase the rate of ODS destruction and transitions from high-GWP to low-GWP gases and associated equipment.

8. Green Buildings

a) Summary of Recommended Actions

The Proposed Update includes development of a comprehensive GHG emission reduction program for new construction, existing building retrofits, and operation and maintenance of certified green buildings. This program would include an integrated approach to development of zero-net-carbon buildings (i.e., net zero carbon emissions over a period of a year). Recommended actions for Green Buildings are provided in Table 2-8.

Table 2-8 Key Recommended Actions for Green Buildings
Develop a comprehensive GHG emission reduction program for new construction, existing building retrofits, and operation and maintenance of certified green buildings. Program development to be completed by end of 2017 and incorporate the following principles: • Achieve Executive Order goals for State buildings. • Build on California's existing ZNE building goals and activities by 2015. • Continue research activities to better quantify GHG emissions reduction potential of certified green buildings by 2016. • Strengthen the next two triennial editions (2016 and 2019) of the Green Building

Table 2-8 Key Recommended Actions for Green Buildings
Standards Code with mandatory provisions that increase in stringency to progressively reduce GHG emissions by 2017 and 2020 respectively. • Build on AB 758 Action Plan implementation activities, and explore opportunities to implement a portfolio of green building retrofit requirements at time-of-sale or other trigger mechanism by 2017. • Explore methodologies to quickly but accurately quantify direct and indirect GHG emissions from new and existing buildings by 2017. • By 2017, establish target dates and pathways toward transitioning to zero-net-carbon buildings that expand upon and complement ZNE goals. • By 2018, implement a mechanism to track progress toward achieving statewide green building goals.

b) Compliance Responses

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, retrofits of existing building, and operation and maintenance of certified green buildings. Reasonably foreseeable compliance responses associated with these recommended actions could consist of new requirements that result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar, wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms.

i) Zero-Net-Energy Buildings

Reasonably foreseeable compliance responses associated with ZNE buildings are described above under Section 2.C.1, Energy.

ii) Zero-Net-Carbon Buildings

Reasonably foreseeable compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in zero-net-carbon buildings. Zero-net-carbon, or carbon-neutral, buildings could use high performance design solutions, generate renewable energy and heating on-site or locally, and employ other techniques to eliminate or offset GHG emissions from all GHG impacts associated with a building. Reasonably foreseeable compliance responses to achieve zero-net-carbon buildings could consist of increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and funding of carbon offset technologies.

9. Cap-and-Trade Regulation

a) Summary of Recommended Actions

Under the Proposed Update, the Cap-and-Trade Regulation would continue to be a vital component for achieving California's longer-term, emission-reduction goals. The Cap-and-Trade Regulation creates a gradually declining limit on the sources responsible for 85 percent of California's GHG emissions, establishes the price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy, and affords covered entities the flexibility to seek out and implement the lowest-cost options to reduce emissions. The Proposed Update includes a recommended action to continue the Cap-and-Trade Regulation with GHG emissions caps beyond 2020.

The Cap-and-Trade Regulation places an aggregated emissions cap on the total emissions generated by all covered facilities in the program. Over time, the cap will steadily decline. The cap is enforced by requiring each source that operates under the cap to turn in one allowance or offset credit (up to a maximum of 8% of the obligation) for every metric ton of CO_2e that it emits. The price of allowances is established by the marketplace based on supply and demand. Allowance prices efficiently inform consumption and investment decisions and stimulate the development of new technological solutions that can enable lower-cost reductions now and in the future. The Cap-and-Trade Regulation can also work in concert with direct regulatory measures. Many actions taken to comply with direct regulations can reduce an entity's compliance obligation under the Cap-and-Trade Regulation.

The Cap-and-Trade Regulation currently acknowledges the potential for GHG emission reductions from Carbon Capture and Sequestration (CCS), and states that covered entities may reduce their compliance obligations for each metric ton of CO_2e that has been proven to be sequestered using a Board-approved CCS quantification methodology. An approved methodology has not yet been adopted. The Proposed Update includes a recommended action in the Energy Sector to develop a CCS quantification methodology by 2017. When this methodology is completed and approved, covered entities in the Cap-and-Trade Regulation may be able to reduce their direct compliance obligation by deploying CCS projects at their covered facilities.

At the time of the development of the Proposed Update, staff is proposing a series of amendments to the Cap-and-Trade Regulation. These proposed amendments provide additional process for clarity of implementation, address stakeholder concerns on cost containment, add a new compliance offset protocol for Mine Methane Capture, and extend transition assistance for covered entities in the program. The Initial Statement of Reasons (ISOR) and accompanying environmental analysis for these amendments is found at http://www.arb.ca.gov/regact/2013/capandtrade13/capandtrade13isor.pdf. In addition, ARB plans to propose the addition of a new Rice Cultivation Projects Compliance Offset Protocol and updates to existing Compliance Offset Protocols under the Cap-and-Trade Regulation at the September 2014 Board hearing.

a) Compliance Responses

Reasonably foreseeable compliance responses under a continuation of the Cap-and-Trade Regulation would be similar to those described under the existing Cap-and-Trade Regulation and the currently proposed amendments with the proposed offset protocol for Mine Methane Capture. The Proposed Update continues the existing Cap-and-Trade Regulation's provision allowing for additional offset protocols, which currently consist of U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance, as well as the provisions regarding sector-based offset crediting programs. Including any type of international sector-based offset credits from a jurisdictional sector-based offset program for Reducing Emissions from Deforestation and Forest Degradation (REDD) would not change the offset usage limit established in the Cap-and-Trade Regulation, but would help to ensure there are enough offsets available if the covered entities want to maximize their eight percent usage limit per compliance period. If California were to pursue a unilateral linkage for international offsets such as those from REDD, that would occur through a similar linkage type rulemaking process as the one conducted for linking with Québec. If ARB proposes any future rulemaking to include REDD offset credits, staff will prepare an environmental analysis for public and Board consideration.

Additionally, when the development of a CCS quantification methodology is completed and approved, reasonably foreseeable compliance responses under the extended Cap-and-Trade Regulation could include the deployment of CCS projects (see the Energy Sector section of this chapter for a detailed description of the recommended action and reasonably foreseeable compliance responses for CCS methodology development). If covered entities employed CCS projects to reduce their compliance obligations, there could also be a reduced need for offsets and allowances by covered entities.

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3.0 ENVIRONMENTAL AND REGULATORY SETTING

The California Environmental Quality Act (CEQA) Guidelines require an environmental impact report (EIR) to include an environmental setting section that discusses the current environmental conditions in the vicinity of the project. This environmental setting normally constitutes the baseline physical conditions against which an impact is compared to determine whether it is significant. (Cal. Code Regs., tit. 14, § 15125.) As discussed above in Chapter 1, the Air Resources Board (ARB) is exempt from preparing an EIR. However, in an effort to comply with the policy objectives of CEQA, an environmental setting and a regulatory setting with environmental laws and regulations relevant to the Proposed First Update to the Climate Change Scoping Plan (Proposed Update) have been included as Attachment 2 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 associated with the Proposed First Update to the Climate Change Scoping Plan (Proposed Update). Section A of this chapter begins with a review of the measures contained in the initial Scoping Plan and subsequent actions that the Air Resources Board (ARB) and others have taken to implement the measures. Section B of this chapter follows with an analysis of impacts associated with the recommended actions contained in the Proposed Update, including feasible mitigation measures that could reduce any potentially significant adverse impacts.

A. Prior Environmental Impact Analysis and Mitigation

As noted in Chapter 1, this Environmental Analysis (EA) supplements the California Environmental Quality Act (CEQA) Functional Equivalent Document (2008 FED) and 2011 Final Supplement to the Assembly Bill (AB) 32 Scoping Plan Functional Equivalent Document (2011 Supplement) prepared for the initial Scoping Plan, and builds upon other environmental documents prepared for specific GHG emission reduction regulations and related programs implemented since 2008. The impact analyses from these other documents are briefly summarized in Attachment 3 for each sector addressed in the initial Scoping Plan.

CEQA allows incorporation by reference for all or portions of other documents, when long, descriptive, or technical materials provide general background, but do not contribute directly to the analysis of the project under consideration. Thus, ARB hereby incorporates the relevant documents by reference, as they are cited in this EA. Incorporated documents are available on ARB's website at http://www.arb.ca.gov or in person at the Board Administration and Regulatory Coordination Unit of the Air Resources Board, located at 1001 I Street, Sacramento, California, 95814.

B. Impact Analysis and Mitigation Measures for the Proposed Update

The following discussion provides a programmatic environmental analysis of the reasonably foreseeable compliance responses that could result from implementation of the recommended actions in the Proposed Update, which are described in Chapter 2 of this 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, with a discussion of potential impacts of recommended actions and associated compliance responses that could result in environmental impacts for each sector described in the Proposed Update. The reasonably foreseeable compliance responses associated with the project are analyzed in a programmatic manner for several reasons: (1) any individual action or activity would be carried out under the same authorizing statutory authority (i.e., the Global Warming Solutions Act of 2006); (2) the reasonably foreseeable compliance responses would result in generally similar environmental effects that can be mitigated in similar ways; (see Cal. Code Regs., tit.17, § 15168, subd. (a)(4)) and (3) while the types of foreseeable compliance responses can

be reasonably predicted, the specific location, design, and setting of the actions cannot feasibly be known at this time. If a later activity would have environmental effects that are not examined within this EA, the public agency with authority over the later activity would need to conduct additional environmental review, as necessary.

To consider the range of reasonably foreseeable compliance responses associated with recommended actions in the nine sectors identified in the Proposed Update, the following analysis addresses the impacts on the environment associated with both the recommended actions and the reasonably foreseeable compliance responses that may be required to implement the recommended action (e.g., expansion of manufacturing facilities for alternative fuel and/or zero-emission, heavy-duty vehicle technologies).

Some of the recommended actions are cross-cutting activities that could result in reasonably foreseeable compliance responses in multiple sectors in the Proposed Update. For example, carbon capture and sequestration (CCS) quantification methodology is a recommended action in the Energy Sector that could also result in reasonably foreseeable compliance responses in the Transportation Sector under the Low Carbon Fuel Standard (LCFS), and also under the Cap-and-Trade Regulation. In the case of CCS, potential impacts and mitigation related to this recommended action and associated compliance responses are covered under the Energy Sector. Impact discussions include, where relevant, construction-related effects, operational effects of new or modified facilities, and influences of the recommended actions on GHG and air pollutant emissions. Because the specific location, extent, and design of potential new and/or modified facilities 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., conservative in that the conclusions tend to overstate adverse effects). These impact discussions are followed by the types of mitigation measures that could be typically required to reduce potentially significant environmental impacts.

1. Aesthetics

a) Energy Sector

Impact 1.a

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to utility-scale renewable energy projects. Compliance responses could include: zero-net-energy (ZNE) design standards for homes and business, demand-response programs, distributed renewable energy generation, combined heat and power (CHP) systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar photovoltaic (PV) and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground

caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Some of the reasonably foreseeable compliance responses could be accomplished with minimal ground-disturbing activity. For instance, energy storage systems could be developed by modifying existing hydroelectric dams. Smart-grid technology includes installation of smart meters, which look similar to traditional energy meters and do not result in building modifications. Improvements to energy production, processing, storage, distribution, and transmission systems could be minimal, and consist of general housekeeping, vapor recovery valves, and frequent maintenance checks. While implementation and operation of some of these features could potentially alter the appearance of some existing visual settings, those that occur within the footprints of existing facilities would generally result in minimal adverse effects on aesthetic resources.

Construction of ZNE homes and businesses, CHP, and energy storage technologies would likely require the operation of new facilities or more than minimal modifications to existing facilities. In addition, to meet offset requirements, compliance responses may involve renewable energy and CCS project proposals. Renewable energy projects associated with these compliance actions could range from installation of solar panels and micro-turbines onto buildings (e.g., to create ZNE buildings or CHP systems) to large-scale energy generation facilities, such as solar PV and wind turbine farms, and geothermal plants.

Development of new facilities, although expected to occur in areas appropriately zoned, could conceivably introduce or increase the presence of visible artificial elements (e.g., heavy-duty equipment, vegetation removal, new or expanded buildings) in areas of scenic importance, such as visibility from a 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 prominence, and placement in the landscape. In addition, facility operation may introduce substantial sources of glare, exhaust plumes, and nighttime lighting for safety and security purposes.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with the Energy Sector, would be potentially significant.

Potential scenic and nighttime lighting impacts associated with the Energy Sector could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects.

Mitigation Measure 1.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of aesthetic resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities or infrastructure that

would be approved by other State agencies or local jurisdictions. The ability to require such measures is within the purview of jurisdictions with land use approval and/or permitting authority. Project-specific impacts and mitigation would be identified during the project review process carried out by agencies with approval authority. Recognized practices routinely required to avoid and/or minimize impacts to aesthetic resources include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must certify that the environmental document was prepared in compliance with applicable regulations prior to approval of a project for development.
- Based on the results of the environmental review, proponents would implement all feasible mitigation identified in the environmental document to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.
- The project proponent would color and finish the surfaces of all project structures and buildings visible to the public to: (1) minimize visual intrusion and contrast by blending with the landscape; (2) minimize glare; and (3) comply with local design policies and ordinances. The project proponent would submit a surface treatment plan to the lead agency for review and approval.
- To the extent feasible, the sites selected for use as construction staging and laydown areas would be areas that are already disturbed and/or are in locations of low visual sensitivity. Where feasible, construction staging and laydown areas for equipment, personal vehicles, and material storage would be sited to take advantage of natural screening opportunities provided by existing structures, topography, and/or vegetation. Temporary visual screens would be used where helpful, if existing landscape features did not screen views of the areas.
- All construction, operation, and maintenance areas would be kept clean and tidy, including the re-vegetation of disturbed soil and storage of construction materials and equipment would be screened from view and/or are generally not visible to the public, where feasible.
- Siting projects and their associated elements next to important scenic landscape features or in a setting for observation from State scenic highways, national historic sites, national trails, and cultural resources would be avoided to the greatest extent feasible.
- The project proponent would contact the lead agency to discuss the documentation required in a lighting mitigation plan, submit to the lead agency a plan describing the measures that demonstrate compliance with lighting requirements, and notify the lead agency that the lighting has been completed and is ready for inspection.

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 this 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 scenic and nighttime lighting impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational scenic and nighttime lighting impacts resulting from the development of new facilities or modification of existing facilities associated with Energy Sector actions would be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 1.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The main types of recommended actions associated with the Transportation Sector include: (1) improving vehicle efficiency and develop zero-emission technologies; (2) reducing the carbon content of fuels and provide market support to encourage the use of these fuels; (3) planning for and implement sustainable communities to reduce vehicular GHG emissions and provide more transportation options; and (4) improving the efficiency and throughput of existing transportation systems.

These actions could result in the reasonably foreseeable compliance responses of an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or low- and zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts on scenic vistas, scenic resources, visual character, and light and glare would be of similar type and magnitude as those discussed under Impact 1.a for the Energy Sector.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with the Transportation Sector, would be potentially significant.

Potential scenic and nighttime lighting impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects.

Mitigation Measure 1.b: Implement Mitigation Measure 1.a

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 this 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 scenic and nighttime lighting impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational scenic and nighttime lighting impacts resulting from the development of new facilities or modification of existing facilities associated with Transportation Sector actions would be **potentially significant and unavoidable**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 1.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions associated with the Agriculture Sector involve GHG emission reduction and carbon sequestration opportunities. Farm and ranch management practices would be facility-specific and based upon facility size and types of and number of animals and crops. Reasonably foreseeable compliance responses could include: nitrogen management, such as the use of nitrification inhibitors or fertigation; methane (CH_4) capture from manure; and soil management practices, including changing tilling practices or cropping patterns. In addition, precision irrigation, and using the cleanest, most efficient, and well maintained equipment, and locally generated biofuels could reduce fuel use.

Furthermore, local and regional land use planning could be used to incentivize conservation easements, urban growth boundaries, and maintenance of agricultural zoning. Other planning efforts may include recommendations from the Bioenergy Action Plan that address economic, infrastructure, and regulatory limitations associated with the use of digester biogas into natural gas pipelines and bioenergy into the electric grid.

Reasonably foreseeable compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Relaxation of regulatory limitations associated with the use

of digester biogas in natural gas pipelines and bioenergy to supply the electricity grid could result in the installation of some equipment. However, these would likely constitute minor modifications to existing facilities.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with the Agriculture Sector, would be **less than significant**.

d) Water Sector

Impact 1.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. The construction and operation of new and/or modified recycled water and wastewater plants could occur; however, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts on scenic vistas, scenic resources, visual character, and light and glare would be of similar type and magnitude as those discussed under Impact 1.a for the Energy Sector.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with the Water Sector, would be potentially significant.

Potential scenic and nighttime lighting impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects.

Mitigation Measure 1.d: Implement Mitigation Measure 1.a

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 this 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 scenic and nighttime lighting impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational scenic and nighttime lighting impacts resulting from the development of new facilities or modification of existing facilities associated with Water Sector actions would be **potentially significant and unavoidable**.

e) Waste Management Sector

Impact 1.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the recommended actions in the Waste Management sector would be reasonably expected to result in construction and operation of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, reasonably foreseeable compliance responses may include installation of CH_4 control devices at existing landfills. While some of these activities could occur within existing landfills, the construction and operation of new facilities may be necessary to accommodate increased demand of organic waste diversion.

The types of impacts on scenic vistas, scenic resources, visual character, and light and glare would be of similar type and magnitude as those discussed under Impact 1.a for the Energy Sector.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with the Waste Management Sector, would be potentially significant.

Potential scenic and nighttime lighting impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects.

Mitigation Measure 1.e: Implement Mitigation Measure 1.a

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 this 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 scenic and nighttime lighting impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational scenic and nighttime lighting impacts resulting from the development of new facilities or modification of existing facilities associated with the Waste Management Sector actions would be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 1.f

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: California Natural Resources Agency (CNRA), California Environmental Protection Agency (CalEPA), the Governor's Office of Planning and Research (OPR), California Department of Food and Agriculture (CDFA), California Department of Forestry and Fire Protection (CalFire), Board of Forestry and Fire Protection (BOF), California Department of Fish and Wildlife (CDFW), and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

Reasonably foreseeable compliance responses associated with the Natural and Working Lands Sector actions would generally aim to increase the amount of vegetation in existing urban areas and conserve natural and working landscapes. Enhancement of urban forests and protection of natural and working landscapes from conversion to urban development typically retain or improve natural features helping to define the aesthetic character of urban and rural areas. Thus, this aspect of implementation could be beneficial depending on the extent that conservation of natural lands and existing working lands is increased. However, in addition to compliance responses related to urban forests and land conservation, incentives could be created to encourage the use

of urban, agricultural, and forest wastes to produce electricity and transportation fuels. This could be accomplished through the construction and operation of biomass energy generation facilities. The location and size of these facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of impacts on scenic vistas, scenic resources, visual character, and light and glare would be of similar type and magnitude as those discussed under Impact 1.a for the Energy Sector.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with the Natural and Working Lands Sector, would be potentially significant.

Potential scenic and nighttime lighting impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects.

Mitigation Measure 1.f: Implement Mitigation Measure 1.a

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 this 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 scenic and nighttime lighting impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational scenic and nighttime lighting impacts resulting from the development of new facilities associated with Natural and Working Lands Sector actions would be **potentially significant and unavoidable**.

g) Short-Lived Climate Pollutants Sector

Impact 1.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes four types of recommended actions associated with the Short-Lived Climate Pollutants Sector: (1) high-global warming potential (GWP) fluorinated gas (F-gas) phasedown, (2) low-GWP requirements, (3) ozone-depleting substances (ODS); and (4) recovery and destruction, and high-GWP fees. Reasonably foreseeable compliance responses associated with the Short-Lived Climate Pollutant Sector actions could result in replacement of high-GWP compounds with low-GWP compounds. This could change the chemicals used in commercial refrigeration and air

conditioning, transport refrigeration, aerosol propellant metered dose inhalers, solvents, fire suppressants, sulfur hexafluoride (SF_6) uses, and structural pesticide fumigants. Increased demand for replacement compounds in these applications, and related equipment, could result in the construction and operation of new manufacturing facilities or modification of existing manufacturing facilities.

ODS recovery and destruction, and replacement of high-GWP compounds with low-GWP compounds could be incentivized through mitigation fee programs. These incentives could increase the rate of ODS destruction and support the transition from high-GWP to low-GWP gases and associated equipment. The increased demand for new low-GWP compounds and ODS destruction could result in new manufacturing facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that are appropriately zoned to accommodate them.

The types of impacts on scenic vistas, scenic resources, visual character, and light and glare would be of similar type and magnitude as those discussed under Impact 1.a for the Energy Sector.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with the Short-Lived Climate Pollutants Sector, would be potentially significant.

Potential scenic and nighttime lighting impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects.

Mitigation Measure 1.g: Implement Mitigation Measure 1.a

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 this 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 scenic and nighttime lighting impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational scenic and nighttime lighting impacts resulting from the development of new facilities or modification of existing facilities associated with Short-Lived Climate Pollutants Sector actions would be **potentially significant and unavoidable**.

h) Green Buildings

Impact 1.h

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, retrofits of existing building, and operation and maintenance of certified green buildings. Reasonably foreseeable compliance responses associated with these recommended actions could consist of new requirements that result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar, wind turbines, waste digesters), fuel cells, along with the construction and operation of carbon offset technologies, including solar PV or wind turbine farms.

The types of impacts on scenic vistas, scenic resources, visual character, and light and glare would be of similar type and magnitude as those discussed under Impact 1.a for the Energy Sector.

Short-term construction-related impacts and long-term operational impacts on aesthetics, associated with Green Buildings, would be potentially significant.

Potential scenic and nighttime lighting impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects.

Mitigation Measure 1.h: Implement Mitigation Measure 1.a

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 this 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 scenic and nighttime lighting impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational scenic and nighttime lighting impacts resulting from the development of new facilities or modification of existing facilities associated with recommended actions for Green Buildings would be **potentially significant and unavoidable.**

i) Cap-and-Trade Regulation

Impact 1.i

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the Functional Equivalent Document (FED) prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms (2010 Cap-and-Trade FED). This includes compliance responses to reduce GHG emissions by covered entities, continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses to reduce GHG emissions would consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities, and as such would not change the character of the project sites. The ODS Offset Protocol would not introduce activities that disrupt aesthetic or visual settings. The Livestock Offset Protocol would include the construction of digesters in agricultural settings. Digesters are consistent with agricultural uses and would not represent an adverse change to the visual character of the vicinity. The Urban Forest Offset Protocol would improve the quality of the urban visual environment and would be considered aesthetically beneficial. The Forest Offset Protocol would not increase the amount of forest activities, but could shift activities to projects that increase carbon sequestration. This shift could change the visual character of offset project sites over time, but would not pose an adverse visual impact. Managing forests to increase cover and remove dead and diseased trees may be a visually beneficial effect.

Impacts related to CCS are described above under the Energy Sector.

2. Agricultural and Forest Resources

a) Energy Sector

Impact 2.a

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to utility-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include energy-related facilities, such as solar PV and wind turbine farms, new CHP or CCS facilities, retrofit of existing facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to existing oil and gas pipelines (e.g., valves).

Construction of new renewable energy facilities and transmission lines from such 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. Major solar or wind energy project proposals have not typically involved conversion of substantial areas of forest land for the energy generation facilities, themselves; however, transmission lines from new facilities have required alignments in forest land. It is reasonably foreseeable that forest land could be converted as a result of additional utility-scale renewable energy facility development.

In response to proposals for development of renewable energy projects on important farmland, local governments and the State have faced the challenge of balancing competing public interest in conserving agricultural land and meeting goals for expanding renewable energy generation. Utility-scale solar and wind energy facilities proposed to be located on important farmland, including property under Williamson Act contracts, have resulting in land conversion. In 2013, a California appellate court upheld an EIR's evaluation of agricultural land impact and mitigation for a proposed solar project on prime farmland and Williamson Act contract land where a contract cancellation was proposed. The court decision also confirmed that it was appropriate for the local lead agency to consider the State's interest in increasing renewable energy generation as a reason to permit the cancellation of a Williamson Act contract (*Save Panoche Valley v. San Benito County, 2013, 217 Cal.App.4th 503).* Consequently, conversion of important farmland could occur in response to the recommended actions in the Energy Sector. Because ARB has no land use authority, mitigation is not within its purview to reduce potentially significant impacts to less-than-significant levels. While compliance with existing land use policies, ordinances, and regulations would serve to

moderate this impact, because of local priorities for protection of agricultural land, the record of recent project approvals in the State demonstrate the impact has not been avoided.

As a result, short-term construction-related and long-term operational on agricultural and forest resource associated with Energy Sector actions would be potentially significant.

This impact on agricultural and forest resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 2.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of agricultural and forest resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities or infrastructure that would be approved by local jurisdictions. The ability to require such measures is within the purview of jurisdictions with local or State land use approval and/or permitting authority. Project-specific impacts and mitigation would be identified during the development review process carried out by agencies with project-approval authority. Recognized practices routinely required to avoid and/or minimize impacts to agricultural and forest land include:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance response to new regulations would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts of the project. The definition of actions required to mitigate potentially significant agricultural and forest land impacts may include the following actions. Because ARB has no land use authority, mitigation is not within its purview to reduce potentially significant impacts to less-than-significant levels. Any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
    - Avoidance of important agricultural and forest land, to the extent feasible.
    - The establishment and recording of a farmland or forest conservation easement to protect other land in the region.
    - The purchase of credits in an already-established, approved farmland mitigation bank.
    - Contribution to county agricultural sustainability funds.

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 this 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 agricultural or forest resource impacts. Also, because public interest in agricultural and forest land conservation may compete with the public interest in expanding renewable energy generation, local agencies could decide to permit the conversion of agricultural and forest resources when approving proposed renewable energy facilities. Past approvals of renewable energy facilities by local governments have resulted in the recognition of an unavoidable significant adverse effect related to agricultural land conversion, even after adoption of all feasible mitigation measures.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval in some circumstances, this EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related and long-term operational agricultural and forest resource impacts resulting from the development of new facilities associated with Energy Sector actions would be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 2.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improving vehicle efficiency and develop zero emission technologies; (2) reducing the carbon content of fuels and provide market support to encourage the use of these fuels; (3) planning for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improving the efficiency and throughput of existing transportation systems. These strategies could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

Many local governments have adopted land use policies to protect important agricultural and forest land from conversion to urban development, including industrial facilities that may be constructed in response to the increased demand for alternative fuel and zero-

emission vehicles. While it is reasonable to anticipate that land use policies controlling the location of new industrial facilities would generally avoid conversion of important agricultural land, the potential cannot be entirely dismissed. If a proposed facility were located on important farmland or property under a Williamson Act Contract, conversion of the agricultural land to urban uses would be a potentially significant impact.

As a result, short-term construction-related and long-term operational agricultural and forest resource impacts of Transportation Sector actions would be potentially significant.

Potential agricultural and forest resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local or State land use or permitting agencies with approval authority over the particular development projects. However, because ARB has no land use authority, mitigation is not within its purview to reduce potentially significant impacts to less-than-significant levels.

Mitigation Measure 2.b: Implement Mitigation Measure 2.a

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 this 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 agricultural or forest land impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational agricultural and forest resource impacts resulting from the development of new facilities or modification of existing facilities associated with Transportation Sector actions would be **potentially significant and unavoidable**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 2.c

Short-Term Construction-Related Impacts

Reasonably foreseeable compliance responses associated with the recommended actions in the Agriculture Sector would incentivize onsite management practices and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial conversion of agriculture or forest lands.

Thus, short-term construction-related impacts on agricultural and forest resources, associated with the Agriculture Sector, would be **less than significant.**

Long-Term Operational Impacts

Overall, implementation of recommendations associated with the Agriculture Sector would increase conservation of agriculture and forest resources.

Therefore, the Proposed Update could result in a **beneficial** long-term operational impact to agricultural and forest resources.

d) Water Sector

Impact 2.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. The construction and operation of new and/or modified recycled water and wastewater plants could occur; however, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts on farmland, zoning for agricultural use or Williamson Act Contract, and forest land and timberland would be of similar type and magnitude as those discussed under Impact 2.a under the Energy Sector.

Short-term construction-related impacts and long-term operational impacts of Water Sector actions on farmland, zoning for agricultural use or Williamson Act Contract, Forest Land, and Timberland would be potentially significant.

This impact on agricultural and forest resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 2.d: Implement Mitigation Measure 2.a

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 this 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 agricultural or forest land impacts. Consequently, while impacts could 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 short-term construction-related and long-term operational agricultural and forest land impacts resulting from the development new facilities or modification of existing facilities associated with the Water Sector would be **potentially significant and unavoidable**.

e) Waste Management Sector

Impact 2.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the recommended Waste Management Sector actions could in reasonably foreseeable compliance responses that include construction and operation of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling, development of biomass facilities, and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

The types of impacts on farmland, zoning for agricultural use or Williamson Act Contract, and forest land and timberland would be of similar type and magnitude as those discussed under Impact 2.a under the Energy Sector.

Short-term construction-related and long-term operational impacts of Waste Management Sector actions on farmland, zoning for agricultural use or Williamson Act Contract, Forest Land, and Timberland would be potentially significant.

This impact on agricultural and forest resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 2.e: Implement Mitigation Measure 2.a

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 this 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 agricultural or forest land impacts. Consequently, while impacts could 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 short-term construction-related and long-term operational agricultural and forest land impacts resulting from the development new facilities or modification of existing facilities associated with the Waste Management Sector would be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 2.f

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

However, in addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could result in the construction and operation of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass power facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The fuel source for biomass facilities is generally woody biomass acquired primarily from hazardous fuel removal, forest thinning, and other forest management activities. Removal of woody biomass from the surrounding forests could modify habitat for common and special-status species, degrade sensitive habitats, and/or result in fill of jurisdictional waters of the United States. However, forest projects that would generate the woody biomass are separate projects that would be subject to separate environmental review and permitting. The generation of woody biomass would occur

regardless of the proposed biomass project. Disposal of the woody biomass at these types of facilities in lieu of other disposal methods such pile burning would not have a substantial, long-term effect on forest resources.

Construction of new renewable energy facilities and transmission lines from such 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. Major solar or wind energy project proposals have not typically involved conversion of substantial areas of forest land for the energy generation facilities, themselves; however, transmission lines from new facilities have required alignments in forest land. It is reasonable to anticipate that forest land could be converted as a result of additional utility-scale renewable energy facility development.

In response to proposals for development of renewable energy projects on important farmland, local governments and the State have been forced to face the challenge of balancing the sometimes competing public interest in conserving agricultural land and meeting goals for expanding renewable energy generation. Utility-scale solar and wind energy facilities proposed to be located on important farmland, including property under Williamson Act contracts, have resulted in land conversion. In 2013, a California appellate court upheld an EIR's evaluation of agricultural land impact and mitigation for a proposed solar project on prime farmland and Williamson Act contract land where a contract cancellation was proposed. The court decision also confirmed that it was appropriate for the local lead agency to consider the State's interest in increasing renewable energy generation as a reason to permit the cancellation of a Williamson Act contract (*Save Panoche Valley v. San Benito County, 2013, 217 Cal.App.4th 503).* Consequently, it is reasonable to anticipate that conversion of important farmland could occur in response to the recommended actions in the Natural and Working Lands Sector.

Thus, short-term construction-related impacts and long-term operational impacts on agricultural and forest resources associated with the Natural and Working Lands Sector would be potentially significant.

This impact on agricultural and forest resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 2.f: Implement Mitigation Measure 2.a

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 this 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 agricultural or forest land impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational agricultural and forest land impacts resulting from the development new facilities or modification of existing facilities associated with the Natural and Working Land Sector would be **potentially significant and unavoidable**.

g) Short-Lived Climate Pollutants Sector

Impact 2.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

As described above, the increased demand for new low-GWP compounds, and ODS destruction could result in the construction and operation of new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of impacts of the Short-Lived Climate Pollutant Sector on farmland, zoning for agricultural use or Williamson Act Contract, and forest land and timberland would be of similar type and magnitude as those discussed under Impact 2.a under the Energy Sector.

Short-term construction-related and long-term operational impacts of the Short-Lived Climate Pollutants Sector on farmland, zoning for agricultural use or Williamson Act Contract, Forest Land, and Timberland would be potentially significant.

This impact on agricultural and forest resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 2.g: Implement Mitigation Measure 2.a

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 this 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 agricultural or forest land impacts.

Consequently, while impacts could 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 short-term construction-related impacts and long-term operational agricultural and forest land impacts resulting from the development of new

facilities or modification of existing facilities associated with the Short-Lived Climate Pollutants Sector would be **potentially significant and unavoidable**.

h) Green Buildings

Impact 2.h

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions for Green Buildings include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses would consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, along with the construction and operation of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

New activities, including buildings, and renewable energy supply installations could be placed on land that is currently used for agricultural purposes.

The types of impacts on farmland, zoning for agricultural use or Williamson Act Contract, and forest land and timberland would be of similar type and magnitude as those discussed under Impact 2.a under the Energy Sector.

Short-term construction-related impacts and long-term operational impacts of Green Buildings on farmland, zoning for agricultural use or Williamson Act Contract, Forest Land, and Timberland would be potentially significant.

This impact on agricultural and forest resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 2.h: Implement Mitigation Measure 2.a

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant agricultural or forest land impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational

agricultural and forest land impacts resulting from the development new facilities or modification of existing facilities associated with Green Buildings would be **potentially significant and unavoidable**.

i) Cap-and-Trade Regulation

Impact 2.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update and is incorporated by reference. Impacts described in the 2010 Cap-and-Trade FED are summarized below and detailed in Attachment 3 of this EA.

The covered entity compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities would not be expected to impact agriculture or forest resources.

Implementation of projects under the ODS Offset Protocol does not include activities that impact agriculture or forest resources. Implementation of projects under the Livestock Offset Protocol does include the construction of digesters in agricultural settings. Digesters are consistent with agricultural uses and would not represent an adverse change to agriculture or forest resources. Implementation of projects under the Urban Forest Offset Protocol does not impact agriculture or forest resources. Implementation of projects under the Forest Offset Protocol does not increase the amount of forest activities, but could shift activities to projects that increase carbon sequestration. Managing forests to increase cover and remove dead and diseased trees may be considered a beneficial impact to forests. Implementation of projects under the Forest Offset Protocol does not include actions that would encourage the conversion of agricultural land to forest.

Impacts related to CCS are described above under the Energy Sector.

3. Air Quality

a) Energy Sector

Impact 3.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Proposed development of new or modified manufacturing facilities would be required to secure local or State land use approvals prior to their implementation. Part of the development review and approval process requires that projects undergo environmental review consistent with California environmental laws (e.g., CEQA) and other applicable local requirements (e.g., local air quality management district rules and regulations). This environmental review process would include an assessment of whether project implementation would result in short-term construction-related air quality impacts.

At this time, the specific location, type, and number of construction activities is not known and would be dependent upon a variety of factors that are not within the control or authority of ARB and not within its purview. Nonetheless, the analysis presented herein provides a good-faith disclosure of the types of construction emission impacts that could occur with implementation of these reasonably foreseeable compliance responses. Further, subsequent environmental review would be conducted at such time that an individual project is proposed and land use or construction approvals are sought.

During the construction phase, criteria air pollutants (CAPs) and toxic air contaminants (TACs) could be generated from a variety of activities and emission sources. These emissions would be temporary and occur intermittently depending on the intensity of construction on a given day. Site grading and excavation activities would generate fugitive particulate matter (PM) dust emissions, which is the primary pollutant of concern during construction. Fugitive PM dust emissions (e.g., respirable particulate matter [PM_{10}] and fine particulate matter [$PM_{2.5}$]) vary as a function of several parameters, such as soil silt content and moisture, wind speed, acreage of disturbance area, and the intensity of activity performed with construction equipment. Exhaust emissions from off-road construction equipment, material delivery trips, and construction worker-commute

trips could also contribute to short-term increases in PM emissions, but to a lesser extent. Exhaust emissions from construction-related mobile sources also include reactive organic gases (ROG) and oxides of nitrogen (NO_X). These emission types and associated levels fluctuate greatly depending on the particular type, number, and duration of usage for the varying equipment.

The site preparation phase typically generates the most substantial emission levels because of the on-site equipment and ground-disturbing activities associated with grading, compacting, and excavation. Site preparation equipment and activities typically include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers). Although detailed construction information is not available at this time, based on the types of activities that could be conducted, it would be expected that the primary sources of construction-related emissions include soil disturbance- and equipment-related activities (e.g., use of backhoes, bulldozers, excavators, and other related equipment). Based on typical emission rates and other parameters for above mentioned equipment and activities, construction activities could result in hundreds of pounds of daily NO_X and PM emissions, which may exceed general mass emissions limits of a local or regional air quality management district depending on the location of generation. Thus, implementation of new regulations and/or incentives could generate levels that conflict with applicable air quality plans, exceed or contribute substantially to an existing or projected exceedance of State or national AAQS, result in a cumulatively considerable net increase in non-attainment areas, or expose sensitive receptors to substantial pollutant concentrations.

As a result, short-term construction-related air quality impacts associated with the Energy Sector would be potentially significant.

This short-term construction-related air quality impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 3.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of air quality. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is within the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would likely qualify as a “project” under CEQA, because they would generally need a discretionary public agency approval and could affect the physical environment. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices routinely required to avoid and/or minimize impacts to air quality include the following:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance responses would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local jurisdiction with land use authority would determine that the environmental review process complied with CEQA and other applicable regulations, prior to project approval.
- Based on the results of the environmental review, proponents would implement all feasible mitigation identified in the environmental document to reduce or substantially lessen the construction-related air quality impacts of the project.
- Project proponents would apply for, secure, and comply with all appropriate air quality permits for project construction from the local agencies with air quality jurisdiction and from other applicable agencies, if appropriate, prior to construction mobilization.
- Project proponents would comply with the Clean Air Act and the California Clean Air Act (e.g., New Source Review and Best Available Control Technology criteria if applicable).
- Project proponents would comply with local plans, policies, ordinances, rules, and regulations regarding air quality-related emissions and associated exposure (e.g., construction-related fugitive PM dust regulations, indirect source review, and payment into offsite mitigation funds).
- For projects located in PM nonattainment areas, prepare and comply with a dust abatement plan that addresses emissions of fugitive dust during construction and operation of the project.

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, while impacts could 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 short-term construction-related air quality impacts resulting from the development of new facilities or modification of existing facilities associated with Energy Sector actions would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

As discussed above, the reasonably foreseeable compliance responses could include a number of different types of new facilities or modifications to existing facilities, such as

CHP and/or CCS. Within a more regional perspective, large-scale facilities such as CHP can offer substantially lower CAP and GHG emission rates compared with conventional power generating and/or thermal heating systems operating within the same region. As noted in the energy demand section below, these technologies have the potential to displace the operation of existing, or reduce the need for new, conventional electricity and heating systems within the same region. Thus, implementing actions to support increased CHP facility development and other reasonably foreseeable compliance responses could be beneficial to regional air quality conditions.

In addition, reasonably foreseeable compliance responses associated with the Energy Sector also include operation of renewable energy projects, such as solar PV farms and wind turbine farms. These types of projects could result in an indirect emission reduction by displacing emissions associated with fossil-fuel fired power plant electricity generation that otherwise would occur. Thus, implementing such actions could also be beneficial to air quality conditions through replacement of coal, or other fossil-fueled power plants.

However, the operation of CHP and/or CCS systems or other technologies at an existing or new facility could adversely affect local air quality emissions. The amount and type of CAPs and TACs would depend on the type of technology used. Table 4-1 shows the primary pollutants from some CHP technologies that may be considered under new regulations developed in response to recommended actions in the Proposed Update.

Table 4-1 Primary Pollutants from CHP Technologies

CHP Technology	Primary Pollutants
Gas Turbines	NO_X, CO, VOCs (non-methane, non-ethane hydrocarbons due to incomplete combustion), SO_X, PM, and CO_2 depending on the fuel used
Microturbines	NO_X, CO, VOCs, negligible amount of SO_2, and CO_2 depending upon fuel used
Fuel Cell Systems	CO, NO_X, negligible SO_X, and CO_2 depending upon fuel used

Notes: NO_X = oxides of nitrogen; CO=carbon monoxide; VOCs=volatile organic compounds; SO_X = oxides of sulfur; PM=particulate matter
Source: EPA 2008

Stationary sources (e.g., CHP or CCS) that generate CAPs and/or TACs would be required to obtain authorities to construct and permits to operate from the applicable local air district. In addition, stationary sources would be required by law to comply with all applicable air district rules and regulations for CAPs and TACs (e.g., new source review, implementation of best available control technologies and control measures). The permit process along with adherence to all applicable rules and regulations require that these sources be equipped with the required emission controls and that,

individually, these sources would not result in emissions that exceed applicable thresholds. In addition, non-permitted sources of emissions (e.g., employee commute trips and deliveries) would be anticipated to be minor.

Long-term operational air quality impacts associated with the Energy Sector would be **less than significant**.

b) Transportation Sector

Impact 3.b

Short-Term Construction-Related Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of construction-related impacts on air quality would be of similar type and magnitude as those discussed under Impact 3.a under the Energy Sector.

Short-term construction-related impacts associated with the Transportation Sector on air quality would be potentially significant.

Mitigation Measure 3.b (1): Implement Mitigation Measure 3.a

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, while impacts could 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 short-term construction-related air quality impacts resulting from the development of new facilities or modification of existing facilities associated with the Transportation Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Despite the dramatic emission reductions and air quality improvements achieved to date, most urban areas of California, including Southern California, the Bay Area, and the Central Valley continue to exceed the national AAQS for ozone. ARB, the South Coast Air Quality Management District, and the San Joaquin Valley Air Pollution Control District are beginning to evaluate the emission reductions needed to attain the more health-protective ozone standard US EPA established in 2008. In order to meet these challenges, air quality and land-use agencies in the South Coast and San Joaquin Valley are actively pursuing a coordinated strategy that results in the widespread use of zero-emission technologies on transportation networks designed to reduce smog forming emissions from single occupant vehicle use.

Strategies that would improve vehicle efficiency and develop zero-emission technologies would reduce emissions from conventional gasoline and diesel trucks because new fleets would contain vehicles that would be rated as low- or no-emission transport systems. Over time, older vehicles would be replaced with similar low- or no-emission vehicles. This would eliminate a substantial amount of air pollutants associated with diesel- and gasoline-fueled trucks as they would increasingly make up a smaller percentage of vehicles. While the specific compliance measures would require evaluation to determine the anticipated results of this regulation, reductions in CAPs would be expected as these reasonably foreseeable compliance responses are implemented. In addition, communities would be planned to improve transportation options and system, thereby reducing the use of personal vehicles. Reductions in personal vehicle use could provide benefits to air quality.

Battery-powered electric vehicles require electricity, which could be generated from fossil fuels. Generation of electricity from fossil fuels results in emissions, including SO_2, NO_X, PM, and CO_2 depending on the source (e.g., coal, natural gas, solar). These would constitute stationary source emissions. Stationary sources that generate CAPs and/or TACs would be required to obtain authorities to construct and permits to operate from the applicable local air district. In addition, stationary sources would be required by law to comply with all applicable air district rules and regulations for CAPs and TACs (e.g., new source review, implementation of best available control technologies and control measures). The permit process along with adherence to all applicable rules and regulations would require these sources be equipped with the required emission controls and that, individually, these sources would not result in emissions that exceed applicable thresholds. In addition, non-permitted sources of emissions (e.g., employee commute trips and deliveries) would be anticipated to be minor.

Transportation fuels included in the LCFS are produced from a variety of feedstocks. These feedstocks include crude oil, natural gas, biomass material, biowaste material, waste grease, animal tallow, and municipal solid waste. Relative to petroleum diesel emissions from engine combustion, biodiesel emissions have been shown to contain less PM, hydrocarbons, carbon monoxide, and polycyclic aromatic hydrocarbons. However, available measurements indicate that the combustion of higher biodiesel blends in certain diesel engines can increase the release of NO_X, which, in addition to its association with potential health effects, has been identified as an ozone precursor. (Cal/EPA Multimedia Working Group 2013).

Long-term operational impacts of the Transportation Sector on air quality are considered to be potentially significant.

Mitigation Measure 3.b(2)

Given the wide variety of oils and fats that could be used to make biodiesel fuel, the actual emissions of PM and TAC should be considered for each proposed formulation of biodiesel fuel to be used in California. This situation requires a systematic and ongoing effort to assess emissions from diesel engines. But it should be recognized that, due to the large number of fuel formulations along with the resources and cost required to evaluate each formulation, it is not feasible to assess all combinations of engine types and fuel formulations. This is especially the case with additives, since the number of additive and feedstock combinations could be large. ARB is developing a regulatory process by which alternative diesel fuels are evaluated so that any appropriate restrictions can be imposed as new fuels are introduced into the market.

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of air quality. ARB is the lead agency for the LCFS Program, and is currently preparing an EA for proposed LCFS amendments, in compliance with CEQA and ARB's certified regulatory program, to assess the environmental effects associated with implementation of various low-carbon fuel options. The LCFS EA will include an analysis of the direct and indirect impacts associated with feedstock production, transportation to facilities, alternative fuels production, the use of those fuels, and other components of the LCFS program. Because proposed LCFS amendments are still under development, this EA does not attempt to address the specific details of potential impacts associated with implementation of that program or mitigation that may be implemented to reduce any adverse environmental impacts identified. Thus, this EA conservatively assumes, based upon information prepared by the California EPA Multimedia Working Group, that increased NO_X emissions could be associated with combustion of some higher biodiesel blends in certain diesel engines (Cal/EPA 2013).

The potential increases in NO_X emissions associated with combustion of some higher biodiesel blends is expected to be reduced to a less-than-significant level through the regulatory process by which alternative diesel fuels are evaluated so that any appropriate restrictions can be imposed as new fuels are introduced into the market. However, because that process has not been completed at this time, this EA takes the

conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes in this EA, that long-term operational impacts on air quality associated with the Transportation Sector could be **potentially significant and unavoidable**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 3.c

Short-Term Construction-Related Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in construction-related activities.

Thus, short-term construction-related air quality impact associated with the Agriculture Sector would be **less than significant**.

Long-Term Operational Impacts

Reasonably foreseeable compliance responses associated with the Agriculture Sector could include a variety of practices that would reduce N_2O, and CO_2 emissions through fertilization practices, soil management practices, and reductions in fuel and water use. In addition, the production of biofuels could offset air quality emissions associated with fossil-based fuels.

Development and implementation of these types of compliance responses for the Agricultural Sector would result in **beneficial** long-term operational air quality impacts.

d) Water Sector

Impact 3.d

Short-Term Construction-Related Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within

State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of short-term construction-related impacts associated with the Water Sector on air quality would be of similar type and magnitude as those discussed under Impact 3.a for the Energy Sector, and would be potentially significant.

This short-term construction-related air quality impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 3.d: Implement Mitigation Measure 3.a

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, while impacts could 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 short-term construction-related air quality impacts resulting from the development of new facilities or modification of existing facilities associated with the Water Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Recommended actions associated with the Water Sector could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

Air quality impacts associated with new facilities or modifications to existing facilities could generate long-term emissions associated with recycling water and wastewater plants operations. The quantity of emissions would be dependent of the types of technologies installed, and may include VOC, NO_X, and PM. However, stationary sources that generate CAPs and/or TACs would be required to obtain authorities to construct and permits to operate from the applicable local air district. In addition, stationary sources would be required by law to comply with all applicable air district rules and regulations for CAPs and TACs (e.g., new source review, implementation of best available control technologies and control measures). The permit process along with adherence to all applicable rules and regulations would require these sources be equipped with the required emission controls and that, individually, these sources would not result in emissions that exceed applicable thresholds. In addition, non-permitted sources of emissions (e.g., employee commute trips and deliveries) would be anticipated to be minor.

Long-term operational impacts on air quality associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 3.e

Short-Term Construction-Related Impacts

Implementation of the recommended actions in the Waste Management sector could result in a number of reasonably foreseeable compliance responses, including the construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and reduction of methane emissions from organics in the waste stream. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location of any new facilities or modification of existing facilities. However, these would likely occur within

existing developed area footprints or in areas with zoning that would permit the development of manufacturing or industrial uses.

The types of construction-related impacts on air quality would be of similar type and magnitude as those discussed under Impact 3.a under the Energy Sector.

Short-term construction-related impacts on air quality, associated with the Waste Management Sector would be potentially significant.

This short-term, construction-related, air quality impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 3.e(1): Implement Mitigation Measure 3.a

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, this EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related air quality impacts resulting from the development of new facilities or modification of existing facilities associated with the Waste Management Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Emissions associated with digester operations would depend on several factors, such as the size and type of anaerobic digestion facility (e.g., one-stage or two-stage continuous systems, batch systems, wet or dry processes), any equipment needed for pre-processing, the increased traffic on the local and regional roadway network (including additional waste haul trucks and employees), and the post processing of the biogas (e.g., flaring of excess biogas, combusting for electricity, or cleaning up biogas for use as a transportation fuel or injection to utility transmission lines). Operational sources of fugitive dust would primarily be processing equipment and truck movement over paved and unpaved surfaces. In addition, non-methane VOCs released from pre-digested substrate materials during the receipt and pre-processing activities at anaerobic digestion facilities would not be a regional change, but could result in an increase in local emissions. Although there will be emissions associated with these sources at anaerobic digestion facilities, the operation of these facilities would divert organics out of landfills. By doing so, there would be less activity at the landfill, such as potentially fewer pieces of off-road equipment and a potential decrease in the vehicle

miles traveled VMT for haul trucks. The anaerobic digestion facilities could also generate biogas to replace fossil fuels for electricity production or for vehicle transportation.

Stationary sources that generate CAPs and/or TACs would be required to obtain authorities to construct and permits to operate from the applicable local air district. In addition, stationary sources would be required by law to comply with all applicable air district rules and regulations for CAPs and TACs (e.g., new source review, implementation of best available control technologies and control measures). The permit process along with adherence to all applicable rules and regulations would require these sources be equipped with the required emission controls and that, individually, these sources would not result in emissions that exceed applicable thresholds. In addition, non-permitted sources of emissions (e.g., employee commute trips and deliveries) would be anticipated to be minor.

Long-term operational air quality impacts associated with the Waste Management Sector would be **less than significant**.

Odors

Implementation of the recommended actions in the Waste Management sector could result in a number of reasonably foreseeable compliance responses, including the construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and reduction of methane emissions from organics in the waste stream. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

Factors that would affect potential odor impacts include the design of proposed anaerobic digestion or composting facilities, sensitive receptor proximity, and exposure duration. Anaerobic digestion is the biological decomposition of organic matter in the absence of molecular oxygen. As a result, odorous compounds, such as ammonia and hydrogen sulfide (H_2S), are generated and could be released into the environment. The anaerobic digestion process occurs naturally in marshes, wetlands and is the principal decomposition process in landfills. However, in the operation of anaerobic digestion facilities, processes occur in a closed system. VOCs are broken down through the anaerobic digestion process, and exhaust is generally processed in a more controlled environment.

However, the collection transport, storage, and pre-processing activities of the potentially odiferous organic substrates for digestion and the resultant digestate could produce nuisance odors at anaerobic digestion facilities. Similarly, the collection, transport, storage and pre-processing of organic materials for composting could also produce nuisance odors. The siting of these facilities could lead to objectionable odors at off-site receptors in the vicinity.

Thus, long-term operation-related odor impacts associated with the Waste Management Sector could be potentially significant.

Potentially significant odor impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local lead agencies with approval authority over the particular development projects.

Mitigation Measure 3.e(2):

Applicants for the development of anaerobic digestion facilities would be required to comply with appropriate local or State land use plans, policies, and regulations, including applicable setbacks and buffer areas from sensitive land uses for potentially odoriferous processes. If an anaerobic digestion or composting facility would handle organic or compostable material and is classified as a compostable material handling facility, the facility must develop an Odor Impact Minimization Plan (OIMP) pursuant to 14 CCR 17863.4. Otherwise, applicants shall develop and implement an Odor Management Plan (OMP) that incorporates equivalent odor reduction controls for digester operations. Odor control strategies that could be incorporated into these plans include, but are not limited to, the following:

- A list of potential odor sources.
- Identification and description of the most likely sources of odor.
- Identification of potential, intensity, and frequency of odor from likely sources.
- A list of odor control technologies and management practices that could be implemented to minimize odor releases. These management practices would include the establishment of the following criteria:
    - Require substrate haulage to the AD facility within sealed containers.
    - Establish time limit for on-site retention of undigested substrates (i.e., substrates must be put into the digester within 24 hours of receipt).
    - Provide enclosed, negative pressure buildings for indoor receiving and preprocessing. Treat collected foul air in a biofilter or air scrubbing system.
    - Establish contingency plans for operating downtime (e.g., equipment malfunction, power outage).
    - Manage delivery schedule to facilitate prompt handling of odorous substrates.
    - Handle digestate within enclosed building and/or directly pump to sealed containers for transportation.
    - Protocol for monitoring and recording odor events.
    - Protocol for reporting and responding to odor events.

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 this 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 odor-related impacts.

Consequently, this EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational odor-related impacts associated with the Waste Management Sector would be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 3.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

Reasonably foreseeable compliance responses associated with the Natural and Working Land Sector could encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations with appropriate zoning.

The types of construction-related impacts on air quality would be of similar type and magnitude as those discussed under Impact 3.a under the Energy Sector.

Construction-related impacts on air quality associated with the Natural and Working Lands Sector would be potentially significant.

This short-term construction-related air quality impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 3.f(1): Implement Mitigation Measure 3.a

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, while impacts could 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 short-term construction-related air quality impacts associated with the Natural and Working Land Sector, would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Recommended actions under the Natural and Working Lands Sector include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs. These types of projects would improve air quality in two ways: (1) through the CO_2 sequestration benefits of grasslands, scrublands, and wetlands; and (2) forest management practices that could reduce the potential for wildfires, and therefore potential PM emissions. While these actions would not provide immediate benefit, over time they would lead to beneficial air quality effects.

However, recommended actions associated with the Natural and Working Lands Sector could result in development of biomass facilities. Biomass facilities convert biomass, such as woody wastes from forest residues to useful steam, heat, or combustible gases. The two basic types of conversions systems consist of gasification and direct combustion for electricity generation. Gasification systems generate electricity through combustion of syngas (i.e., synthetic gas produced from the conversion of organic

solids and liquids under heat and controlled air or oxygen); and direct combustion systems burn biomass in a furnace, which supplies heat to a boiler that produces steam. Syngas, from gasification systems, are used to generate electricity in an internal combustion engine or turbine. Steam, from direct combustion systems, generates electricity through the use of a steam turbine.

Combustion systems would generate varying levels of NO_X, ROG, SO_X, PM_{10}, and $PM_{2.5}$. In addition, operational activities would result in emissions of CAPs and TACs, including the chipping of biomass before it is hauled to the plant, trucks hauling biomass to the plant and idling at the project site on both paved and unpaved roads, operation of a loader at the plant and fuel yard, employee commute trips, and trucks hauling waste byproducts (e.g., biochar) away from the plant.

Without project specific details, it is not possible to determine if long-term operational emissions would result in a violation or substantial contribution to an existing air quality violation, exposure of sensitive receptors to substantial pollutant concentration, and/or conflict with air quality planning efforts. However, because air quality planning efforts are regional in nature, accounting of CAPs and TACs should be limited to the air basin in which reductions occur. However, project proponents would be required to coordinate with local or State land use agencies, and seek entitlement for development of the project, including the completion of all necessary environmental review requirements. While it can reasonably be assumed that new biomass facilities would be required to obtain stationary source permits, it is not possible to determine the level emissions from all associated non-permitted operations (e.g., hauling, commuter trips, chipping).

Thus, long-term operational air quality impacts associated with the Natural and Working Lands Sector could be potentially significant.

This operational air quality impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 3.a(2)

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of air quality. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is within the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would likely qualify as a “project” under CEQA, because they would generally need a discretionary public agency approval and could affect the physical environment. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices routinely required to avoid and/or minimize impacts to long-term air quality emissions include the following:

- Heavy-duty construction equipment shall be maintained in proper working condition according to manufacturer's specifications. Prior to start-up of plant operations, the applicant shall provide a plan, for approval by the local planning department and air pollution control district. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available. The applicant or its representative shall submit to the local planning department and air pollution control district the specification of both the dozer and loader, including the horsepower rating, engine production year, and projected average daily hours of use for each piece of equipment. If either equipment item is replaced in the future the plant operator shall select a model that is at least as efficient as the previous model with respect to its rate of NO_X emissions.

- Operators of heavy-duty construction equipment shall minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes (as required by the state airborne toxics control measure [Title 13, Section 2485 of the California Code of Regulations]).

- Haul trucks shall be prohibited from idling while dumping their biomass load at the truck dump. The plant operator shall provide clear signage that posts this requirement s for truck drivers at the entrances to the site and at the truck dumps.

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, operational emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, while impacts could 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 long-term operational air quality impacts associated with Natural and Working Sector actions would be **potentially significant and unavoidable**.

g) Short-Lived Climate Pollutants Sector

Impact 3.g

Short-Term Construction-Related Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction-related impacts on air quality, associated with the Short-Lived Climate Pollutants Sector, would be of similar type and magnitude as those discussed under Impact 3.a under the Energy Sector.

Construction-related impacts on air quality associated with the Short-Lived Climate Pollutants Sector would be potentially significant.

This short-term, construction-related, air quality impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 3.g: Implement Mitigation Measure 3.a

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, while impacts could 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 short-term construction-related air quality impacts associated with the Short-Lived Climate Pollutants Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Incineration of CFCs and HCFCs could result in emissions of hydrofluoric acid, HCl, Cl2, organic acids, products of incomplete combustion (PICs), dioxins, and furans. These compounds are classified as TACs.

However, stationary sources that generate TACs would be required to obtain authorities to construct and permits to operate from the applicable local air district. In addition, stationary sources would be required by law to comply with all applicable air district rules and regulations for TACs (e.g., new source review, implementation of best available control technologies and control measures). The permit process along with adherence to all applicable rules and regulations would require these sources be equipped with the required emission controls and that, individually, these sources would not result in emissions that exceed applicable thresholds. In addition, non-permitted sources of emissions (e.g., employee commute trips and deliveries) would be anticipated to be minor.

Long-term operational air quality impacts associated with the Short-Lived Climate Pollutant Sector would be **less than significant**.

h) Green Buildings

Impact 3.h

Short-Term Construction-Related Impacts

The recommended actions for Green Buildings include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with these recommended actions could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

The types of construction-related impacts on air quality associated with Green Buildings would be of similar type and magnitude as those discussed under Impact 3.a under the Energy Sector.

Short-term construction-related impacts on air quality associated with Green Buildings would be potentially significant.

This short-term construction-related air quality impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 3.h: Implement Mitigation Measure 3.a

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 this EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of

mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction activities.

Consequently, while impacts could 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 short-term construction-related air quality impacts associated with Green Buildings would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the recommended actions in Green Buildings would encourage the use of several technologies that reduce energy demand compared to the existing housing stock. These reasonably foreseeable compliance responses include high-performance design solutions (energy efficiency), renewable energy facilities, and on-site or locally generated heat sources. In addition, communities could be planned to provide efficient transportation systems, and designs that encourage people to walk or bike, rather than using personal vehicles. Thus, recommended actions associated with Green Buildings would result in reductions in demand for electricity, natural gas, and transportation fuels and; consequently, reductions in associated CAPs and TACs.

Long-term operational air quality impacts associated with Green Buildings would be **beneficial**.

i) Cap-and-Trade Regulation

Impact 3.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are summarized below and detailed in Attachment 3 of this EA.

The Cap-and-Trade Regulation is designed to reduce GHG emissions. However, measures that reduce GHG emissions are expected to provide co-benefits as reductions of CAPs and TACs. Statewide, the level of GHG, CAPs, and TACs is

expected to be reduced as a result of the Cap-and-Trade Regulation. This is a beneficial effect.

The covered entity compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities involve construction, grading and trenching which have the potential to result in short-term construction-related air quality impacts. The FED identified recognized measures that exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this impact may be potentially significant impact and unavoidable.

The FED concluded it was extremely unlikely the program would result in increases in localized air impacts due to facilities in some areas increasing their operations (because of the trading allowed under the program). The Co-Pollutant Emissions Assessment (Appendix P to the Staff Report prepared for the rulemaking) concluded that even if such potential emissions increases did occur, such increases would be small within the context of the larger cumulative emissions reductions that would occur as a result of California's extensive emissions control program. However, the FED acknowledged that, because specific actions by covered entities cannot be determined in the program level environmental analysis, specific adverse localized emissions impacts could not be ruled out. Because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this impact is potentially significant and unavoidable. The Board adopted the Adaptive Management Plan as an integral part of implementation of the program to address any such unanticipated, unintended and ongoing adverse localized air quality impacts.

Implementation of projects under the ODS Offset Protocol and the Livestock Offset Protocol would produce incidental emissions from transportation and construction which would be less than significant. Both of these protocols reduce GHG emissions, considered a beneficial effect.

Implementation of projects implemented under the Urban Forest Offset Protocol would produce incidental emissions that would be less than significant. Implementation of projects under the Forest Offset Protocol would not alter the level of forest activities, and therefore, would have a less than significant air quality impact.

Impacts related to CCS are described above under the Energy Sector.

4. Biological Resources

a) Energy Sector

Impact 4.a

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Although it is reasonably foreseeable that construction activities could occur, there is uncertainty as to the exact location of any new facilities or modification of existing facilities. Construction could require disturbance of undeveloped areas, 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.

The future development of renewable energy projects could affect biological resources in various ways, depending on the types of technology. For instance, operation of wind farms could result in the direct mortality of birds and bats through collision with rotating turbines or transmission lines or trauma from turbulence or pressure changes surrounding the moving turbines. Development of solar energy development is considered to have direct effects and habitat loss for desert tortoise and other sensitive desert wildlife. In addition, human activities in previously undeveloped areas potentially provide food or other attractants in the form of trash, litter, or water, which draw unnaturally high numbers of predators such as the common raven, kit fox, and coyote. Depending on the size and location of utility-scale renewable projects, construction and operation could reduce the ability of terrestrial wildlife populations to move unimpeded through an area. In addition, impacts to aquatic habitat, such as diversion of stream flows, could impede movement of native fishes and aquatic wildlife, conflict with adopted habitat conservation plans, natural communities conservation plans, and other conservation plans or other policies to protect natural resources.

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 within disturbed areas at existing manufacturing facilities.

The biological resources that could be affected by the construction and operation of new or modified manufacturing plants or renewable energy projects would depend on the specific location of any necessary construction and its environmental setting. Adverse impacts could include modifications to existing habitat; including removal, degradation, and fragmentation of riparian systems, wetlands, or other sensitive natural wildlife habitat and plant 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.

Consequently, short-term construction-related and long-term operational impacts to biological resources associated with the Energy Sector would be potentially significant.

This impact on biological resources associated with the Energy Sector could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 4.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of biological resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize impacts to biological resources include:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance response to new regulations would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all feasible mitigation identified in the environmental document to reduce or substantially lessen the potentially significant impacts to biological resources. The definition of actions required to mitigate potentially significant

biological impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.

- Retain a qualified biologist to prepare a biological inventory of site resources prior to ground disturbance or construction. If protected species or their habitats are present, comply with applicable federal and State endangered species acts and regulations. Construction and operational planning will require that important fish or wildlife movement corridors or nursery sites are not impeded by project activities.
- Retain a qualified biologist to prepare a wetland survey of onsite resources. This survey shall be used to establish setbacks and prohibit disturbance of riparian habitats, streams, intermittent and ephemeral drainages, and other wetlands. Wetland delineation is required by Section 3030(d) of the Clean Water Act and is administered by the U.S. Army Corps of Engineers.
- Prohibit construction activities during the rainy season with requirements for seasonal weatherization and implementation of erosion prevention practices.
- Prohibit construction activities in the vicinity of raptor nests during nesting season or establish protective buffers and provide monitoring, as needed, to address project activities that could cause an active nest to fail.
- Prepare site design and development plans that avoid or minimize disturbance of habitat and wildlife resources, and prevent stormwater discharge that could contribute to sedimentation and degradation of local waterways. Depending on disturbance size and location, a National Pollution Discharge Elimination System (NPDES) construction permit may be required from the California State Water Resources Control Board.
- Prepare spill prevention and emergency response plans, and hazardous waste disposal plans as appropriate to protect against the inadvertent release of potentially toxic materials.
- Plant replacement trees and establish permanent protection suitable habitat at ratios considered acceptable to comply with “no net loss” requirements.

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 the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 short-term construction-related and long-term operational impacts to biological resources resulting from development of new facilities or modification of existing facilities associated with Energy Sector actions would be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 4.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improving vehicle efficiency and develop zero emission technologies; (2) reducing the carbon content of fuels and provide market support to encourage the use of these fuels; (3) planning for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improving the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts to biological resources related to the manufacturing of these technologies would be of similar type and magnitude as those discussed under Impact 4.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to biological resources associated with the Transportation Sector would be potentially significant.

This impact on biological resources associated with the Transportation Sector could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 4.b: Implement Mitigation Measure 4.a

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 this 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, while impacts could 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 short-term construction-related and long-term operational impacts to biological resources associated with the Transportation Sector would be **potentially significant and unavoidable**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 4.c

Short-Term Construction-Related Impacts

Reasonably foreseeable compliance responses associated with the recommended actions in the Agriculture Sector would incentivize onsite management practices and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities and not result in substantial conversion of habitat.

Thus, short-term construction-related impacts on biological resources associated with the Agriculture Sector would be **less than significant**.

Long-Term Operational Impacts

Compliance responses associated with the recommended actions in the Agriculture Sector would incentivize efficient and precise use of nitrogen fertilizers and irrigation water, conservation tillage practices, and land use planning strategies that protect croplands, forests, rangelands, and wetlands. These programs would reduce the over-application of nitrogen fertilizers which, combined with over-irrigation, can lead to nitrogen contamination and oxygen depletion of adjacent aquatic habitats. Implementation of reduced tillage and conservation tillage programs would reduce sediment transport into surface waters which would also protect aquatic habitats. Finally, preventing the conversion of croplands, forests, rangelands, and wetlands to developed uses would reduce habitat loss from both common and special status species.

Overall, implementation of recommended actions in the Agriculture Sector would increase conservation of biological resources, resulting in a **beneficial** long-term operational impact.

d) Water

Impact 4.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Wetlands or drainages could be affected by pipeline trenching activities, bore and jack installation under stream, and other construction activities. These could further affect riparian habitat, and result in the removal or disturbance of riparian vegetation, and alteration of bed and banks of drainage due to trenching.

In addition, operation of facilities associated with modifications to an existing water management strategy could affect discharge rates into stream and from wastewater treatment plants. Depending on the location of programs, aquatic and terrestrial species that rely upon water features could be adversely affected (e.g., fish, migratory birds).

Although it is reasonably foreseeable that construction and operational activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

Short-term construction-related and long-term operational impacts to biological resources associated with the Water Sector could be potentially significant.

This impact on biological resources associated with the Water Sector could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 4.d: Implement Mitigation Measure 4.a

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 this 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, while impacts could 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 short-term construction-related and long-term operational impacts to biological resources resulting from the development new facilities or modification of existing facilities associated with the Water Sector would be **potentially significant and unavoidable**.

e) Waste Management Sector

Impact 4.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the recommended actions in the Waste Management Sector could require construction and operation of new, or expansion of existing, composting and anaerobic digestion facilities.

Impacts to biological resources resulting from the Waste Management Sector recommendations would be of similar type and magnitude as those discussed under Impact 4.a under the Energy Sector, and would be potentially significant.

Short-term construction-related and long-term operational impacts to biological resources associated with the Waste Management Sector would be potentially significant.

This impact on biological resources associated with the Water Management Sector could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 4.e: Implement Mitigation Measure 4.a

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 this 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, while impacts could 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 short-term construction-related and long-term operational impacts to biological resources associated with the Waste Management Sector would be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 4.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

However, in addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. This could be accomplished through increased use of biomass facilities, dairy digesters, and biogas facilities at wastewater treatment plants and landfills. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them. Impacts would be of similar type and magnitude as discussed under Impact 4.a under the Energy Sector.

The types of short-term construction-related impacts to biological resources associated with the Natural and Working Lands Sector would potentially significant.

This impact on biological resources associated with the Natural and Working Lands Sector could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 4.f: Implement Mitigation Measure 4.a

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 this 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, while impacts could 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 short-term construction-related impacts to biological resources associated with the Natural and Working Lands Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

As described above, compliance responses associated with the Energy Sector could include the operation of biomass facilities. The fuel source for biomass facilities is generally woody biomass acquired primarily from hazardous fuel removal, forest thinning, and other forest management activities. Removal of woody biomass from the surrounding forests could modify habitat for common and special-status species, degrade sensitive habitats, and/or result in fill of jurisdictional waters of the United States. However, forest projects that would generate the woody biomass are separate projects that would be subject to separate environmental review and permitting. The generation of woody biomass would occur regardless of the proposed biomass project. Disposal of the woody biomass at these types of facilities in lieu of other disposal methods such pile burning would not have a substantial effect on biological resources.

Therefore, long-term operational impacts on biological resources, associated with the Natural and Working Lands Sector, are considered to be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 4.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

As described above the recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely

that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction and operational impacts to biological resources would be of similar type and magnitude as those discussed under Impact 4.a under the Energy Sector.

Short-term construction-related and long-term operational impacts on biological resources, associated with the Short-Lived Climate Pollutants Sector would be potentially significant.

This impact on biological resources associated with the Short-Lived Climate Pollutants Sector could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 4.g: Implement Mitigation Measure 4.a

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 this 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, while impacts could 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 short-term construction-related and long-term operational impacts to biological resources associated with the Short-Lived Climate Pollutants Sector would be **potentially significant and unavoidable**.

h) Green Buildings

Impact 4.h

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions for Green Buildings include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Reasonably foreseeable compliance responses include increased demand for renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and funding of carbon offset technologies, including solar PV or wind turbine farms, which could require new or expanded manufacturing facilities or renewable energy projects. These activities could result in ground disturbance and habitat loss as well as other impacts similar in type and magnitude to those discussed under Impact 4.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to biological resources associated with Green Buildings would be potentially significant.

This impact on biological resources associated with Green Buildings could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 4.h: Implement Mitigation Measure 4.a

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 this 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, while impacts could 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 short-term construction-related and long-term operational impacts to biological resources associated with Green Buildings would be **potentially significant and unavoidable**.

i) Cap-and-Trade Regulation

Impact 4.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities involve construction, grading and trenching which have the potential to adversely impact any protected biological resources that might exist at those locations. The FED identified recognized measures that exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting

in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that this impact may be potentially significant and unavoidable.

Implementation of projects under the ODS Offset Protocol would not include activities that potentially impact biological resources. Implementation of projects under the Livestock Offset Protocol would include the construction of digesters at or adjacent to existing livestock operations where natural habitats are expected to be absent or limited. As such, the Livestock Offset Protocol would result in less than significant impacts to biological resources. Implementation of projects under the Urban Forest Offset Protocol recognizes tree improvement projects in urban settings, and as such would not be expected to significantly affect biological resources. Implementation of projects under the Forest Offset Protocol would not increase total forest activities, but could shift activities to projects that increase carbon sequestration. Reforestation projects conducted under the Forest Offset Protocol could change existing habitat and disrupt wildlife. The FED identified recognized measures that exist to reduce this potentially significant impact but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that this impact may be potentially significant and unavoidable. The Board adopted the Adaptive Management Plan as an integral part of implementation of the program to reduce the risk of unanticipated, unintended and ongoing adverse impacts to biological resources due to forestry projects under the Forest Offset Protocol.

Impacts related to CCS are described above under the Energy Sector.

5. Cultural Resources

Cultural resource impacts are inherently construction-related and, thus, long-term operational impacts are not discussed below.

a) Energy Sector

Impact 5.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and

microgrid systems, and oil and gas production, processing, storage, distribution, and transmission system upgrades. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

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.

Thus, short-term construction-related impacts to cultural resources associated with the Energy Sector could be potentially significant.

This impact associated with the Energy Sector could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 5.a

The Regulatory Setting in Attachment 2 includes, but is not limited to, applicable laws and regulations that provide protection of cultural resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize impacts to cultural resources include:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance responses to new regulations would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts of the project. The definition of actions required to mitigate potentially significant cultural impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
- Retain the services of cultural resources specialists with training and background that conforms to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61 (36 CFR Part 61).
- Seek guidance from the State and federal lead agencies, as appropriate, for coordination of Nation-to-Nation consultations with the Native American Tribes.
- Consult with lead agencies early in the planning process to identify the potential presence of cultural properties. The agencies will provide the project developers with specific instruction on policies for compliance with the various laws and regulations governing cultural resources management, including coordination with regulatory agencies and Native American Tribes.
- Define the area of potential effect (APE) for each project, which is the area within which project construction and operation may directly or indirectly cause alterations in the character or use of historic properties. The APE should include a reasonable construction buffer zone and laydown areas, access roads, and borrow areas, as well as a reasonable assessment of areas subject to effects from visual, auditory, or atmospheric impacts, or impacts from increased access.
- Retain the services of a paleontological resources specialist with training and background that conforms with the minimum qualifications for a vertebrate paleontologist as described in Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources: Standard Procedures (Society of Vertebrate Paleontology 1995).
- Conduct initial scoping assessments to determine whether proposed construction activities would disturb formations that may contain important paleontological resources. Whenever possible potential impacts to paleontological resources should be avoided by moving the site of construction or removing or reducing the need for surface disturbance. The scoping assessment should be conducted by the qualified paleontological resources specialist in accordance with applicable agency requirements.

- The project proponent's qualified paleontological resources specialist would determine whether paleontological resources would likely be disturbed in a project area on the basis of the sedimentary context of the area and a records search for past paleontological finds in the area. The assessment may suggest areas of high known potential for containing resources. If the assessment is inconclusive a surface survey is recommended to determine the fossiliferous potential and extent of the pertinent sedimentary units within the project site. If the site contains areas of high potential for significant paleontological resources and avoidance is not possible, prepare a paleontological resources management and mitigation plan that addresses the following steps:
    - a preliminary survey (if not conducted earlier) and surface salvage prior to construction;
    - physical and administrative protective measures and protocols such as halting work, to be implemented in the event of fossil discoveries;
    - monitoring and salvage during excavation;
    - specimen preparation;
    - identification, cataloging, curation and storage; and
    - a final report of the findings and their significance.

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding cultural resources associated with Energy Sector actions could be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 5.b

Short-Term Construction-Related Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard

hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of construction-related impacts on cultural resources would be of similar type and magnitude as those discussed under Impact 5.a under the Energy Sector.

Short-term construction-related impacts on cultural resources associated with the Transportation Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 5.b: Implement Mitigation Measure 5.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding cultural resources associated with the Transportation Sector could be **potentially significant and unavoidable**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 5.c

Short-Term Construction-Related Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial

conversion of agriculture or forest lands. Modification of soil, irrigation, and fertilization practices would occur on existing disturbed lands, and would therefore not substantially increase the potential to affect historic, archeological, and paleontological resources, and places important to Native American communities.

Therefore, compliance responses under the Agriculture Sector would result in a **less-than-significant** short-term construction-related impacts on cultural resources.

d) Water

Impact 5.d

Short-Term Construction-Related Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities. The types of construction-related impacts on cultural resources would be of similar type and magnitude as those discussed under Impact 5.a for the Energy Sector.

Short-term construction-related impacts on cultural resources associated with the Water Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 5.d: Implement Mitigation Measure 5.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding cultural resources associated with the Water Sector could be **potentially significant and unavoidable**.

e) Waste Management Sector

Impact 5.e

Short-Term Construction-Related Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

The types of construction-related impacts on cultural resources would be of similar type and magnitude as those discussed under Impact 5.a under the Energy Sector.

Short-term construction-related impacts on cultural resources associated with the Waste Management Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 5.e: Implement Mitigation Measure 5.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related

impact regarding cultural resources associated with the Waste Management Sector could be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 5.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs. In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations with appropriate zoning.

The types of construction-related impacts on cultural resources would be of similar type and magnitude as those discussed under Impact 5.a under the Energy Sector.

Short-term construction-related impacts on cultural resources associated with the Natural and Working Land Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 5.f: Implement Mitigation Measure 5.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding cultural resources associated with the Natural and Working Lands Sector could be **potentially significant and unavoidable**.

g) Short-Lived Climate Pollutants Sector

Impact 5.g

Short-Term Construction-Related Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction-related impacts on cultural resources would be of similar type and magnitude as those discussed under Impact 5.a under the Energy Sector.

Short-term construction-related impacts on cultural resources associated with the Short-Lived Climate Pollutant Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 5.g: Implement Mitigation Measure 5.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding cultural resources associated with the Short-Lived Climate Pollutant Sector would be **potentially significant and unavoidable**.

h) Green Buildings

Impact 5.h

Short-Term Construction-Related Impacts

The Proposed Update includes recommended actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings would consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

New construction activities, including buildings, and renewable energy supply installations could be placed on land that is currently used for agricultural purposes.

The types of construction-related impacts on cultural resources would be of similar type and magnitude as those discussed under Impact 5a under the Energy Sector.

A short-term construction-related impacts on cultural resources associated with Green Buildings would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 5.h: Implement Mitigation Measure 5.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding cultural resources associated with Green Buildings could be **potentially significant and unavoidable**.

i) Cap-and-Trade Regulation

Impact 5.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities involve construction, grading and trenching which have the potential to adversely impact any cultural resources that might exist at those locations. The FED identified recognized measures that exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that this impact may be potentially significant and unavoidable.

Implementation of projects under the ODS Offset Protocol would not include activities that potentially impact cultural resources. Implementation of projects under the Livestock Offset Protocol would include the construction of digesters at or adjacent to existing livestock operations where cultural or historic features could exist. Similarly, implementation of projects under the Urban Forest Offset Protocol includes projects in urban settings where cultural and historic resources could exist. The FED identified recognized mitigation measures that exist to reduce these potential impacts, but the authority to require project-specific mitigation lies with local permitting agencies and not ARB. Consequently, the FED conservatively identified these impacts as significant and unavoidable. Implementation of projects under the Forest Offset Protocol could change the type of forest projects that are undertaken, but would not alter the overall level of forest activities, and as such would not increase potential impacts to cultural resources. This impact would be less than significant.

Impacts related to CCS are described above under the Energy Sector.

6. Energy Demand

a) Energy Sector

Impact 6.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Temporary increases in energy demand associated with construction of 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.

Short-term construction-related impacts on energy demand, associated with the Energy Sector, would be **less than significant**.

Long-term Operational Impacts

The reasonably foreseeable compliance responses associated with the Energy Sector generally orient the State towards renewable energy sources; distributed generation; reduced future energy demand through building design strategies and features; and increased system efficiency through smart-grid and microgrid technologies, and demand-response efforts. These strategies could create an energy generation, storage, and distribution system that relies upon renewable and distributed sources to a greater extent than under existing conditions.

Large scale renewable energy generation projects (e.g., solar PV farms) and CHP systems could affect energy sources and efficiencies - but not necessarily energy demand – by shifting reliance away from more conventional fossil-based fuels and power plants. Likewise, improved energy storage systems, or more efficient distribution systems, would not necessarily reduce demand. However, various emerging

technologies related to smart grid implementation and other demand response actions would support the operational reliability of renewable and distributed energy resources. Reductions in energy demand could be facilitated through modification of new and existing homes and businesses to operate with zero net energy efficiencies, and by increasing the deployment of customer-oriented energy demand response or conservation programs.

Implementation of the recommended actions in the Proposed Update could encourage the development of additional or new energy production, storage, and transmission systems. Such development could gradually reduce the State's reliance on conventional fossil-based fuels, such as natural gas, and increase demand for a more diversified assortment of renewable and conventional fuels.

Thus, long-term operational energy demand impacts associated with the Energy Sector would be **beneficial**.

b) Transportation Sector

Impact 6.b

Short-Term Construction-Related Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improving vehicle efficiency and develop zero emission technologies; (2) reducing the carbon content of fuels and provide market support to encourage the use of these fuels; (3) planning for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improving the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

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.

Short-term construction-related impacts on energy demand, associated with the Transportation Sector, would be **less than significant**.

Long-Term Operational Impacts

The recommended actions associated with the Transportation Sector are aimed to increase the number of light-duty and heavy-duty vehicles that run on zero-emission technologies – hybrids, battery electric vehicles, and fuel cell vehicles, and encourage alternative transportation, such as walking, biking, or public transit. In addition, freight systems could be modified to include near-dock rail, zero-emission container transportation, and zero-emission truck corridors. In terms of energy demand, the Transportation Sector recommendations could shift from conventional vehicles toward battery electric, fuel cell, and hybrid technologies.

Because conventional, hybrid, and electric vehicles require different types of fuel (i.e., petroleum-based fuels or electricity), it is helpful to consider energy demand on a lifecycle basis. A vehicle's energy lifecycle consists of the energy needed to manufacture and transport vehicle parts, use of the vehicle over its lifetime, and disposal at end-of-useable life. A report prepared for ARB considered these factors while evaluating light-duty conventional, battery electric, and hybrid vehicles. The greatest energy requirement occurs during the "use" phase, in which either petroleum fuel or electricity is needed to power the vehicle. This report found that a typical conventional light-duty vehicle would require approximately 860,000 megajoules (MJ); a hybrid would require approximately 560,000 MJ; and a battery electric vehicle would require approximately 510,000 MJ (ARB 2012a). Similarly, fuel production has been found to be lower for electric freight systems than diesel-fueled trucks (California Cleaner Freight Coalition 2013).

Reasonably foreseeable compliance measures associated with the Transportation Sector would reduce overall energy demand, and be considered a **beneficial** long-term operational impact.

Potential effects of electrical vehicle supply equipment on electricity distributions systems are discussed in Section 18, Utilities and Service Systems.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 6.c

Short-Term Construction-Related Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Overall, implementation of recommendations associated with the Agriculture Sector would increase conservation of agriculture and forest resources, thereby decreasing urban sprawl and the amount of energy needed to supply future

developments. 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.

Short-term construction-related impacts on energy demand, associated with the Agriculture Sector, would be **less than significant**.

Long-Term Operational Impacts

Plans to use digester biogas in natural gas pipelines and bioenergy to supply the electricity grid would reduce reliance on the existing energy demand from power plants.

In addition, reducing water usage in the Agriculture Sector would result in reduced electricity demand associating with moving and treating that water.

Therefore, the recommendations in the Agriculture Sector could result in a **beneficial** long-term operational impact to energy demand.

d) Water Sector

Impact 6.d

Short-Term Construction-Related Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of construction-related impacts on energy demand would be of similar type and magnitude as those discussed under Impact 6.a for the Energy Sector.

Short-term construction-related impacts on energy demand associated with the Water Sector would be **less than significant**.

Long-Term Operational Impacts

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector could include increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur.

Water systems require energy to pump, treat, transport, heat, cool, and recycle water. In general, the greatest energy demand is associated with water treatment plants, the number of which could be increased under the Water Sector. The energy requirements associated with water treatment depend primarily on the characteristics of the raw water, plant size, treatment process, and the distance and elevation of the treatment plant in relation to water sources and water distribution systems.

For wastewater treatment, the characteristics of the influent and the level of treatment (primary, secondary or tertiary) are principal drivers of energy consumption. Recycled water is generally secondary- or tertiary-treated wastewater that is used for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, or replenishing a ground water basin (referred to as ground water recharge). Wastewater treatment can be tailored to meet the water quality requirements of a specific planned reuse.

Because of the varying energy demands associated with treatment, displacing sources such as surface water or groundwater with recycled water could reduce energy demand, as exemplified as follows.

- Use of local recycled water to recharge depleted groundwater aquifers would decrease the amount of energy-intensive seawater desalination and surface water supplies.
- When recycled water is distributed to local end users for landscape irrigation, substantial energy savings result from displacing the energy intensity of the highest marginal water source and avoiding the energy used to treat the water unnecessarily to potable water standards.
- Because recycled water is often a by-product of existing secondary and tertiary wastewater treatment processes, it is the least energy-intensive source in the state's water supply.
- Wastewater from urban uses is collected, treated, and discharged back to the environment, where it becomes a source for someone else. Recycling water back

into a water supply system would reduce the need to pump, treat, and distribute water multiple times.

Thus, while there could be a potential increase in energy demand associated with the operation of recycled water treatment plants, and conveyance of water, it would be less energy demand than pumping, treatment, and distribution of raw water supplies.

Long-term operational impacts on energy demand associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 6.e

Short-Term Construction-Related Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and development of anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

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.

Short-term construction-related impacts on energy demand, associated with the Waste Management Sector, would be **less than significant**.

Long-Term Operational Impacts

The use of waste-to-energy facilities would generate energy. This would not decrease overall energy demand but could decrease demand from fossil-based energy sources. There is an energy demand associated with recycling materials. However, these recycling materials would reduce the need to extract and refine natural resources, thereby requiring less energy (EPA 2013). Further development of programs between ARB, CalRecycle, and other State agencies could require that more energy efficient policies are created.

Thus, long-term operational energy demand impacts associated with the Waste Management Sector would be **beneficial**.

f) Natural and Working Lands Sector

Impact 6.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommended actions under the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations with appropriate zoning.

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.

Short-term construction-related impacts on energy demand, associated with the Natural and Working Lands Sector, would be **less than significant**.

Long-Term Operational Impacts

The Natural and Working Lands Sector recommendations would increase vegetation in urban environments and encourage conservation of rural areas. These actions would result in reduced energy through reduced urban heat island effects (e.g., shading provides cooling for buildings), more efficient land use planning (reducing potential urban boundaries), and improving water quality that may reduce treatment requirements. Furthermore, reasonably foreseeable compliance responses include

operation of biomass facilities. While this may not result in decreased energy demand, it could shift supply sources away from fossil-based sources.

Overall, conservation and land use planning recommendations associated with the Natural and Working Lands Sector would result in a **beneficial** long-term operational impact on energy demand.

g) Short-Lived Climate Pollutants Sector

Impact 6.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in construction and operation of new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

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.

Replacement compounds could be required for various items, including commercial refrigeration and air conditioning, transport refrigeration, aerosol propellant metered dose inhalers, solvents, fire suppressants, and structural pesticide fumigants. New low-GWP compounds are likely to be phased in, as refrigerator units and other devices reach the end of their useful lives, and existing stocks become depleted. Production of low-GWP compounds would take the place of production of the existing high-GWP compounds, and would not be expected to experience a substantial and long-term increase in demand.

Short-term construction-related impacts and long-term operational impacts on energy demand associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

h) Green Buildings

Impact 6.h

Short-Term Construction-Related Impacts

The Proposed Update includes actions in the Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance

responses associated with Green Buildings would consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms.

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.

Short-term construction-related impacts on energy demand associated with Green Buildings would be **less than significant**.

Long-Term Operational Impacts

Compliance responses associated with Green Buildings would consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. These building components could be incorporated into new structures or added as part of building remodeling projects.

These types of building design strategies associated with Green Buildings would reduce energy demand, and result in **beneficial** long-term operational impacts.

i) Cap-and-Trade Regulation

Impact 6.i

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols , the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses consist of upgrading equipment, switching to

lower intensity carbon fuels, and implementing maintenance and process changes. These actions will reduce overall energy demand and are considered beneficial effects.

Projects implemented under the compliance offset protocols would not increase energy demand, and as such pose no impacts or less than significant impacts to energy demand.

Impacts related to CCS are described above under the Energy Sector.

7. Geology and Soils

a) Energy Sector

Impact 7.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Although it is reasonably foreseeable that construction and operational activities could occur, there is uncertainty as to the exact location of any new facilities or modification of existing facilities. Construction activities could require disturbance of undeveloped areas, 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. Additional disturbance could result from the increased mineral ore extraction activities which would provide raw materials to these manufacturing facilities and energy projects. These activities would have the potential to adversely affect soil and geologic resources in construction or mineral ore extraction areas.

New facilities could be located in a variety of geologic, soil, and slope conditions with varying amounts of vegetation that would be susceptible to soil compaction, soil erosion and loss of topsoil during construction. The level of susceptibility varies by location. However, the specific design details, siting locations, and soil compaction and erosion hazards for particular manufacturing facilities are not known at this time and would be analyzed on a site-specific basis at the project level. Potential impacts from the mineral extraction process could also include loss of soil productivity resulting from compaction,

erosion, and loss of topsoil; potential soil contamination from mining activities and mineral processing; and fracture, removal, and exposure of geologic materials.

Short-term construction-related impacts to geology and soil resources associated with the Energy Sector would be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 7.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of geology and soils. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a "project" under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize impacts to geology and soils include:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance responses to new regulations would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts on soil erosion and the loss of topsoil. The definition of actions required to mitigate potentially significant geology and soil impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
    - Prior to the issuance of any development permits, proponents of new or modified facilities or infrastructure would prepare a geotechnical investigation/study, which would include an evaluation of the depth to the water table, liquefaction potential, physical properties of subsurface soils including shrink-swell potential (expansion), soil resistivity, slope stability, mineral resources and the presence of hazardous materials.
    - Proponents of new or modified facilities or infrastructure would provide a complete site grading plan, and drainage, erosion, and sediment

control plan with applications to applicable lead agencies. Proponents would avoid locating facilities on steep slopes, in alluvial fans and other areas prone to landslides or flash floods, or with gullies or washes, as much as possible.

- Disturbed areas outside of the permanent construction footprint would be stabilized or restored using techniques such as soil loosening, topsoil replacement, revegetation, and surface protection (i.e. mulching).

Mineral extraction and mining activities that could occur outside of California would be required to comply with the natural resource protection and land reclamation requirements of the appropriate state and federal land managers. The strongest protections for soil and geologic resources are found in the Bureau of Land Management (BLM) and US Forest Service mining permit conditions. All projects on federal lands would be required to provide disclose potential impacts as required by the National Environmental Policy Act. On BLM lands, all mining operations are subject to monitoring by the BLM to protect against unnecessary or undue degradation, and that all operators are responsible for fully reclaiming the area of their claim. Reclamation requires restoration of disturbed areas to stable, self-sustaining, and productive conditions which comply with the land-use plan for the area (EPA 1994). The US Forest Service enforces similar mining reclamation standards for the land it manages. Reclamation requirements for mining operations on private lands vary from state to state.

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 short-term construction-related impacts to geology and soils associated with the Energy Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Recommended actions associated with the Energy Sector include methodology to quantify CCS projects. Geological sequestration of CO_2 is a technology that injects and stores anthropogenic CO_2 produced by various industries and electric generation facilities in porous and permeable subsurface rock units, thereby preventing the release of the CO_2 into the atmosphere where it may contribute to global warming. Few large-scale CO_2 geologic sequestration projects exist today and more research is needed to be to better understand the geologic controls on subsurface rock storage capacities, the

geologic and environmental hazards, and economic feasibility associated with CO_2 geologic sequestration.

Most seismic events result from the natural geologic processes reshaping the earth. However, human activities, such as primary or secondary oil recovery, solution mining, explosions, large impoundments of water, geothermal stimulation, or other fluid injection have also been demonstrated to increase the risk of seismic events by increasing subsurface pressure. When this happens, portions of the subsurface can be induced to move, potentially generating seismic events.

Long-term operational impacts to geology and soil associated with the Energy Sector would be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 7.a

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 this 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 geology and soils impacts.

Permits and/or agreements to reduce potential geology and soils impacts could include, but are not limited to, several classes of Underground Injection Control (UIC) permits administered pursuant to the Safe Drinking Water Act (SDWA) at the federal and State and levels. The US EPA issues Class VI permits under these regulations, which apply to injections wells that are drilled for the sole purpose of CO_2 injection in an underground formation as part of a CCS project, without any other intended purpose. The California Division of Oil, Gas and Geothermal Resources (DOGGR) issues Class II permits under regulatory authority granted by US EPA pursuant to UIC regulations. Class II permits apply to injection wells created for the purpose of extracting oil and gas, including injection wells used for enhanced oil recovery (EOR) methods that could also be used for the purpose of CO_2 sequestration as part of a CCS project.

To obtain these permits, the project proponent would be required to conduct various evaluations, such as engineering studies, geologic study, and injection plans. Requirements for these permits are likely to include: isopach maps, cross sections, and a representative electric log that identifies all geologic units, formations, freshwater aquifers, and oil or gas zones. Because these permits would address inspection, enforcement, mechanical integrity testing, plugging and abandonment oversight, data management, and public outreach, this impact could be reduced to a less than significant level.

Consequently, while impacts could 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 short-term construction and long-term operational impacts to soil and geologic associated with the Energy Sector would be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 7.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions associated with the Transportation Sector could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities. The types of impacts to soil and geologic resources related to the manufacturing of these technologies would be of similar type and magnitude as those discussed under Impact 7.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to geology and soils associated with the Transportation Sector would be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 7.b: Implement Mitigation Measure 7.a

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 this 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 geology and soil impacts.

Consequently, while impacts could 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 short-term construction and long-term operational impacts to

soil and geologic associated with the Transportation Sector would be **potentially significant and unavoidable**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 7.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize efficient and precise use of nitrogen fertilizers and irrigation water, conservation tillage practices, and land use planning strategies that protect croplands, forests, rangelands, and wetlands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial effects on geology and soils.

Programs could reduce the over-application of nitrogen fertilizers, which results in the oxidation of soil organic matter, the release of sequestered carbon, and loss of soil structure (Kahn *et al.* 2007). Incentives for precision farming practices could also reduce the amount of farm equipment traffic and thereby reduce compaction of agricultural soils. Implementation of reduced tillage and conservation tillage programs would reduce soil erosion due to wind and surface runoff.

Overall, implementation of recommended actions associated with the Agriculture Sector would result in **less-than-significant** short-term construction and long-term operational impacts to soil and geological resources.

d) Water Sector

Impact 7.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance,

and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction and operational activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts on geology and soils would be of similar type and magnitude as those discussed under Impact 7.a for the Energy Sector.

Short-term construction-related and long-term operational impacts on soils and geological resources associated with the Water Sector would be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 7.d: Implement Mitigation Measure 7.a

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 this 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 geology and soils impacts.

Consequently, while impacts could 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 short-term construction and long-term operational impacts to soil and geologic resources resulting from the development new facilities or modification of existing facilities associated with the Water Sector would be **potentially significant and unavoidable**.

e) Waste Management Sector

Impact 7.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction and operation of new, or expansion of existing, composting and anaerobic digestion facilities.

Impacts to soil and geologic resources resulting from these recommendations would be of similar type and magnitude as those discussed under Impact 7.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to soil and geologic resources associated with the Waste Management Sector would be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 7.e: Implement Mitigation Measure 7.a

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 this 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 geology and soils impacts.

Consequently, while impacts could 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 short-term construction and long-term operational impacts to soil and geologic associated with the Waste Management Sector would be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 7.f

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction-related impacts to soil and geological resources would be of similar type and magnitude as those discussed under Impact 7.a under the Energy Sector. In addition to construction related impacts, removal of biomass materials from forest lands could involve the use of heavy equipment timber harvest practices that result in ground disturbance, compaction, and increased erosion.

Short-term construction and long-term operations-related impacts on Geology and Soils associated with the Natural and Working Lands Sector could be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 7.f: Implement Mitigation Measure 7.a

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 this 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 geology and soils impacts.

Consequently, while impacts could 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 short-term construction and long-term operational impacts to geology and soils associated with the Natural and Working Lands Sector would be **potentially significant and unavoidable**.

g) Short-Lived Climate Pollutants Sector

Impact 7.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions in the Short-Lived Climate Pollutants sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriate zoned to accommodate them.

The types of impacts to soil and geological resources would be of similar type and magnitude as those discussed under Impact 7.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to soils and geologic resources associated with the Short-Lived Climate Pollutants Sector would be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 7.g: Implement Mitigation Measure 7.a

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 this 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 geology and soils impacts.

Consequently, while impacts could 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 short-term construction and long-term operational impacts to geology and soils associated with the Short-Lived Climate Pollutants Sector would be **potentially significant and unavoidable**.

h) Green Buildings

Impact 7.h

Short-Term Construction-Related Impacts and Long-Term Operational

The Proposed Update includes development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. These programs would drive demand for renewable energy supplies (e.g., solar, wind turbines, waste digesters), fuel cells, and

funding of carbon offset technologies, including solar PV or wind turbine farms, which could require new or expanded manufacturing facilities or renewable energy projects.

These activities would result in impacts to soil and geologic resources similar in type and magnitude to those discussed under Impact 7.a under the Energy Sector.

Impacts to Geology and Soils associated with Green Buildings would be potentially significant.

The impacts to soil and geologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 7.h: Implement Mitigation Measure 7.a

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 this 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 geology and soils impacts. Consequently, while impacts could 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 short-term construction and long-term operational impacts to geology and soils associated with Green Buildings would be **potentially significant and unavoidable.**

i) Cap-and-Trade Regulation

Impact 7.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities involve construction, grading and trenching which have the potential to

result in adverse soil erosion, dust generation, and sedimentation of local waterways. The FED identified recognized measures that exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that this impact as potentially significant and unavoidable.

Implementation of projects under the ODS Offset Protocol would pose no significant impacts on geology, soils and mineral resources. Implementation of projects under the Livestock Offset Protocol would include the construction of digesters that would be subject to regulations considered sufficient to mitigate potential impact to geology, soils and mineral resources to a less than significant level. Implementation of projects under the Urban Forest Offset Protocol would result in only minor soil disturbance and would not be expected to adversely impact geology, soils or mineral resources. This impact would be less than significant. Implementation of projects under the Forest Offset Protocol would not increase total forest activities, but could shift activities to projects that increase carbon sequestration. Because the overall level of forest activities would not change, this impact would be less than significant.

Impacts related to CCS are described above under the Energy Sector.

8. Greenhouse Gases

a) Energy Sector

Impact 8.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location of any new

facilities or the reconstruction or modification of existing facilities. Typical earth-moving equipment that may be necessary for construction includes: graders, scrapers, backhoes, jackhammers, front-end loaders, generators, water trucks, and dump trucks. Specific, project-related construction activities would result in increased generation of GHG emissions associated with the use of heavy-duty off-road equipment, materials transport, and worker commutes. Construction-related GHG emissions are expected to be short-term and limited in amount.

Local agencies, such as air pollution control districts, are generally charged with determining acceptable thresholds of GHG emissions, measured in metric tons of carbon dioxide equivalent per year (MT CO_2e/year). Quantification of short-term construction-related GHG emissions is generally based on a combination of methods, including the use of exhaust emission rates from emissions models, such as OFFROAD 2007 and EMFAC 2011. These models require consideration of assumptions, including construction timelines and energy demands (e.g., fuel and electricity). 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. Thus, agencies generally recommended that GHG analyses focus on operational phase emissions, as discussed below, 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 the Energy Sector would be **less than significant**.

Long-Term Operational Impacts

The reasonably foreseeable compliance responses associated with the Energy Sector are aimed to orient the State toward renewable energy sources, reduce future energy demands through building design strategies and features, and increase system efficiency through smart-grid and microgrid technologies, and demand-response efforts. These strategies could create an energy generation, storage, and distribution system that could rely upon renewable sources to a greater extent than under the existing conditions. Large scale renewable energy generation projects (e.g., solar PV farms) and CHP systems could affect energy sources - but not necessarily energy demand – by shifting reliance of energy sources from fossil-based fuels. Likewise, energy storage devices, or microgrid, actions would not necessarily reduce demands. However, various emerging technologies related to smart grid implementation and other demand response actions would allow an increase in reliability of renewable energy sources, because monitoring efforts could be used to determine when to store energy generated from renewable sources. In addition, reductions in energy demand could be facilitated through modification of existing structure to be ZNE homes and businesses.

Combustion of fossil fuels, such as coal, oil, and natural gas, to produce energy, releases GHG emissions including CO_2 and CH_4. By increasing the share of total electricity generated from wind, solar, and other renewable sources, fuel combustion could be substantially decreased. Furthermore, installation of CCS projects would allow for CO_2 sequestration resulting from industrial emitters. Geological sequestration of CO_2 is a technology that injects and stores anthropogenic CO_2 produced by various industries and electric generation facilities in porous and permeable subsurface rock units, thereby preventing the release of the CO_2 into the atmosphere where it may contribute to global warming. Thus, by orienting the State's energy supply toward renewable sources through production, storage, monitoring, and energy-efficient building construction and reducing the amount of CO_2 that is released into the atmosphere, GHG emission could be reduced.

Long-term operational impacts on GHG emissions associated with the Energy Sector would be **beneficial**.

b) Transportation Sector

Impact 8.b

Short-Term Construction-Related Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improving vehicle efficiency and develop zero emission technologies; (2) reducing the carbon content of fuels and provide market support to encourage the use of these fuels; (3) planning for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improving the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of construction-related impacts related to GHG emissions would be of similar type and magnitude as those discussed under Impact 8.a under the Energy Sector.

Thus, short-term construction-related GHG emissions impacts associated with the Transportation Sector would be **less than significant**.

Long-Term Operational Impacts

The recommended actions associated with the Transportation Sector would increase the number of vehicles that run on zero-emission technologies – hybrids, battery electric vehicles, and fuel cell vehicles; and encourage the use of alternative modes of transportation, such as walking, biking, or public transit. All of these actions would reduce fossil fuel combustion, leading to a decrease in CO_2 emitted during vehicle operation. In addition, black carbon, a subset of PM emissions considered to be a short-lived climate pollutant, becomes distributed into the atmosphere through on-road vehicles.

As described above, in Impact 3.b, vehicles can be considered on a lifecycle basis, which includes manufacture and transport vehicle parts, use of the vehicle over its lifetime, and disposal at end-of-useable life. Comparisons of lifecycle CO_2 equivalents have indicated that the lowest emissions levels would be released by battery electric vehicles, followed by hybrids, and finally conventional vehicles (ARB 2012a). Similarly, fuel production, and therefore associated GHG emissions from generation, has been found to be lower for electric freight systems than diesel-fueled trucks (California Cleaner Freight Coalition 2013).

Thus, reasonably foreseeable compliance responses associated with the Transportation Sector would result in a **beneficial** long-term operational impact on GHG emissions.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 8.c

Short-Term Construction-Related Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Overall, implementation of recommendations associated with the Agriculture Sector would increase conservation of agriculture and forest resources, thereby decreasing the amount of energy needed to supply future developments. As described in the Chapter IV of the Scoping Plan, the primary GHG emissions associated with agriculture include CH_4, CO_2, N_2O, and black carbon. Implementation of the recommended actions associated with the Agriculture Sector would target these emissions through fertilizer, manure, and soil management practices. In addition, reductions in water and fuel use would facilitate a decrease in fuel combustion.

The types of construction-related impacts related to GHG emissions would be of similar type and magnitude as those discussed under Impact 8.a under the Energy Sector.

Thus, short-term construction-related GHG emissions impacts associated with the Agriculture Sector would be **less than significant**.

Long-Term Operational Impacts

Replacing fossil fuels with biofuels—fuels produced from renewable organic material—has the potential to reduce some undesirable aspects of fossil fuel production and use, including GHG emissions. However, because many biofuel feedstocks require land, water, and other resources, research suggests that biofuel production may give rise to several undesirable effects. Depending on the feedstock and production process and time horizon of the analysis, biofuels can emit even more GHGs than some fossil fuels on an energy-equivalent basis (EPA 2014). However, because the Proposed Update would include research and coordination between State, local, and national conservation programs to reduce GHG emission reductions, the recommendations under the Agriculture Sector would result in reduced GHG emissions.

Thus, long-term operational GHG emissions impacts associated with the Agriculture Sector would be **beneficial**.

d) Water Sector

Impact 8.d

Short-Term Construction-Related Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of construction-related impacts on GHG emissions would be of similar type and magnitude as those discussed under Impact 8.a for the Energy Sector.

Thus, short-term construction-related GHG emissions impacts associated with the Water Sector would be **less than significant**.

Long-Term Operational Impacts

Recommended actions associated with the Water Sector could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

Compliance responses associated with the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could also include construction of water recycling and wastewater treatment facilities, which could emit CO_2. However, recommended actions associated with the Water Sector would also increase conservation of water resources, thereby reducing the amount of electricity needed for storage, conveyance, and treatment. While, the GHG emissions associated with this program are currently unknown, coordination between ARB, CEC, SWRCB, and other State agencies will require that the net GHG would result in a net decrease.

Thus, long-term operational GHG emissions impacts associated with the Water Sector would be **beneficial**.

e) Waste Management Sector

Impact 8.e

Short-Term Construction-Related Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling, and development of anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

The types of construction-related impacts related to GHG emissions would be of similar type and magnitude as those discussed under Impact 8.a under the Energy Sector.

Thus, short-term construction-related GHG emissions impacts associated with the Waste Management Sector would be **less than significant**.

Long-Term Operational Impacts

Anaerobic digestion facilities emit CO_2 as a byproduct of combustion. However, this is not considered to be an increase because it is part of the Earth's natural carbon cycle. The plants and trees that make up the paper, food, and other biogenic waste remove CO_2 from the air while they are growing, which is returned to the air when this material is burned. In contrast, when fossil fuels are burned, they release CO_2 that has not been part of the Earth's atmosphere for a very long time (i.e., within a human time scale).

In addition, compared to landfilling, using organic material as feedstock for composting and anaerobic digestion can result in reductions of GHG emissions. The GHG emission reductions from these activities would occur due to avoided landfill emissions, displacement of fossil fuel with biogas, and reduction in synthetic fertilizer and water usage. In addition, composted/digested organic materials can be used in beneficial ways, some of which can further reduce GHG emissions, including decreased water use, increased soil carbon storage, decreased soil erosion, and decreased herbicide use.

Implementation of recommendations under the Waste Management Sector of the Proposed Update would reduce CH_4 emissions through installation of emission reductions devices, reductions in waste generation, and shifting waste to energy. Through determining the best use of recycling, examining ways to increase the use of collected wastes, and funding emission-reducing infrastructure, associated with the Waste Management Sector, GHG emissions would be reduced.

Thus, long-term operational GHG emissions impacts associated with the Waste Management Sector would be **beneficial**.

f) Natural and Working Lands Sector

Impact 8.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be

made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommended actions under the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations of appropriate zoning.

The types of construction-related impacts related to GHG emissions would be of similar type and magnitude as those discussed under Impact 8.a under the Energy Sector.

Thus, short-term construction-related GHG emissions impacts associated with the Natural and Working Lands Sector would be **less than significant**.

Long-Term Operational Impacts

The Natural and Working Lands Sector recommends development of biomass facilities. Biomass typically refers to a quantity of organic, plant-based material. Biomass material is formed through absorption of carbon (in the form of CO_2) from the atmosphere in the presence of energy supplied by the sun. At the end of its life, biomass material breaks down and releases carbon back into the atmosphere, either as CO_2 or CH_4, depending on the decomposition conditions. Aerobic decomposition of biomass occurs in the presence of oxygen, and is conducive to CO_2 formation. Anaerobic decomposition occurs in an oxygen-deprived environment in the presence of bacteria and predominantly results in CH_4 formation along with smaller quantities of CO_2 (CEC 2014). The types of biomass feed stock from the Natural and Working Lands Sector suitable for gasification or combustion largely consist of woody biomass. This is because leafy plant materials do not meet specifications for energy content (i.e., BTU content), high heat value (HV), moisture content, ash content, and chip size. Potential feedstock sources include residuals from forest fuels reduction and defensible space activities; timber harvest residuals including limbs, treetops, and unmerchantable logs generated as byproducts of commercial timber harvest activities; construction and demolition wood waste from building/remodeling activities; and agricultural waste (e.g., orchard clippings, aged-out trees).

Power plants that consume biomass feed stocks—either by direct combustion or via gasification—produce electricity that qualifies for the Renewable Electricity Standard (RES) if the biomass feed stock is considered renewable. While direct combustion or combustion of gasification-produced synthetic gas produces GHG emissions, biomass facilities are considered “carbon neutral” by virtue that the CO_2 emissions are already part of the carbon cycle. For instance, the Buena Vista Biomass plant in Amador County produced electricity using forest thinning slash, urban wood waste (i.e., construction and

demolition wood from building activities), and woody agricultural waste (i.e., orchard prunings) (Amador County 2010:1-1). The Cabin Creek biomass facility proposed in eastern Placer County would consume timber harvest residuals including limbs, treetops, and unmerchantable logs generated as byproducts of commercial timber harvest activities; and residuals as a result of forest fuels reduction and defensible space activities (Placer County 2012:3-11). The proposed Sierra Pacific Cogeneration Power Project in Shasta County would use these feed stocks as well as residue from sawmill operations (Shasta County 2012:2.0-31). Producing electricity with woody biomass from forest thinning, timber harvest residuals, and agricultural waste is considered carbon neutral because these materials would otherwise be piled and burned, resulting in similar levels of GHG emissions. Use of urban wood waste is also considered carbon neutral because this material would otherwise undergo some mix of aerobic and anaerobic decomposition from use as mulch in landscaping applications or as a soil amendment in a compost operation—also resulting in GHG emissions.

While the direct GHG emissions emitted by biomass power facilities are considered to be carbon neutral, operation of biomass facilities also involves other secondary, support-related emissions-generating activities, including the following:

- Transport of biomass feed stocks. Biomass feed stock is transported by truck to the power plants and due to the relatively low energy content of woody biomass large volumes are needed to keep a plant in continuous operation. However, because costs of hauling are high relative to the energy content of the biomass, plants are typically located in areas with abundant biomass availability, which limits the distances of truck haul trips.
- Feedstock processing. Biomass material needs to be collected, chipped, sorted, and/or dried before they are gasified or combusted to generate power. This often involves the operation of a front loader in the biomass storage area and other processing equipment.
- Combustion of starter fuel. Natural gas is typically combusted during start up and shut down of direct combustion biomass plants to maintain flame stabilization.
- Water consumption, wastewater treatment, and waste handling. GHG emissions are associated with energy consumed for the conveyance and treatment of water and wastewater, as well as the handling and off-hauling of byproducts such as ash and biochar.
- Worker commute trips and maintenance activities, generating mobile-source emissions.
- Facility construction, which is relatively small when amortized over the operational life of a facility.

While all of these secondary, support-related activities would result in new GHG emissions relative to existing conditions, the size of the net increase would not be substantial. Project-level quantitative analyses of individual biomass power facilities indicate that secondary, support-related emission of CO_2e would be approximately 4 to

8 percent of direct emissions (Placer County 2012:10-14; Amador County 2010:4.10-14, Shasta County 2012:2.0-33).

A modeling study by the California Energy Commission suggests that biomass power facilities that consume hazardous fuels removed from forests provide a GHG benefit over time because the thinned forests are less likely to become subject to more intense, catastrophic, GHG-emitting wildfires (CEC 2010:xi). Over time, the reduction in wildfire-generated emissions could offset secondary, support-related emissions. Similarly, forest thinning may enable forests to optimize their carbon sequestration potential. However, the degree to which biomass power plants enable more forest thinning activity to take place than would otherwise occur is not well established and this extent of this beneficial effect cannot be quantified.

The addition of any new biomass power plants serving the grid would help the state achieve its RES goal because they offer another method for producing RES-qualifying power. Any power plant using renewable biomass fuels would not likely displace more GHG-intensive fossil natural gas-fired power plants because they would not be economically competitive without substantial subsidies. The state's RES goals will be attained by some mix of solar, wind, geothermal, and qualifying biomass power plants and its unlikely that substantially more renewable power will be produced than is mandated by RES with or without the addition of new biomass power facilities. One advantage of biomass power facilities, however, is that unlike intermittent resources such as solar and wind, biomass facilities are dispatchable and can supply electricity on a 24/7 basis and, therefore, can serve base load demand.

Thus, long-term operational GHG emissions impacts associated with the Natural and Working Lands Sector would be **less than significant**.

g) Short-Lived Climate Pollutants

Impact 8.g

Short-Term Construction-Related Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction-related impacts related to GHG emissions would be of similar type and magnitude as those discussed under Impact 8.a under the Energy Sector.

Thus, short-term construction-related GHG emissions impacts associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

Long-Term Operational Impacts

The Proposed Update includes increasing the use of low-GWP systems and replacing currently used high-GWP gases associated with refrigerators, air conditioners, and foam insulation. Reducing the use of these products would control emissions of HFCs, a fast-growing GHG sources. Controlling these emissions, through implementation of the Short-Lived Climate Pollutants Sector recommendations would result in reduced GHG emissions.

Thus, long-term operational GHG emissions impacts associated with the Short-Lived Climate Pollutants Sector would be **beneficial**.

h) Green Building

Impact 8.h

Short-Term Construction-Related Impacts

The Proposed Update recommends actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects. The types of construction-related impacts related to GHG emissions would be of similar type and magnitude as those discussed under Impact 8.a under the Energy Sector.

Thus, short-term construction-related GHG emissions impacts associated with Green Buildings would be **less than significant**.

Long-Term Operational Impacts

Green buildings are designed, constructed, operated, and maintained to maximize energy efficiency, conserve water, and minimize waste. They are also planned in areas that encourage people to walk, bike, or take public transit rather than drive cars. By comprehensively creating communities that have minimal energy demand and carbon sequestration features, GHG emissions would be reduced compared to existing typical structures and community design.

Thus, long-term operational GHG emissions impacts associated with Green Buildings would be **beneficial**.

i) Cap-and-Trade Regulation

Impact 8.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. , the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocolsThe covered entity compliance responses consisting of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities involves construction activities, possibly including the operation of heavy equipment, that could result in emissions of GHGs during installation of equipment upgrades and/or incidental construction. These emissions would be short-term and considered less than significant.

Ongoing implementation of the Cap-and-Trade Regulation is expected to continue to reduce GHG emissions which is a beneficial effect.

Impacts related to CCS are described above under the Energy Sector.

9. Hazards and Hazardous Materials

a) Energy Sector

Impact 9.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy

storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves). Although there is uncertainty as to the exact locations where new facilities could be constructed or where existing facilities could be reconstructed, these would likely occur within footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses.

These 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 still remains for a significant release of hazardous materials into the environment. Consequently, the 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.

Thus, the short-term construction-related impact associated with the Energy Sector on hazards and hazardous materials would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB

Mitigation Measure 9.a(1)

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that provide protection of geology and soils. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid upset and accident-related impacts include:

- Proponents of new or modified facilities constructed as a compliance response would coordinate with local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local land use agency or governing body would certify that the environmental document was prepared in

compliance with applicable regulations and would approve the project for development.

- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts of the project. The definition of actions required to mitigate potentially significant upset and accident-related hazard impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
- Handling of potentially hazardous materials/wastes should be performed under the direction of a licensed professional with the necessary experience and knowledge to oversee the proper identification, characterization, handling and disposal or recycling of the materials generated as a result of the project. As wastes are generated, they would be placed, at the direction of the licensed professional, in designated areas that offer secure, secondary containment and/or protection from stormwater runoff. Other forms of containment may include placing waste on plastic sheeting (and/or covering with same) or in steel bins or other suitable containers pending profiling and disposal or recycling.
- The temporary storage and handling of potentially hazardous materials/wastes should be in areas away from sensitive receptors such as schools or residential areas. These areas should be secured with chain-link fencing or similar barrier with controlled access to restrict casual contact from non-Project personnel. All project personnel that may come into contact with potentially hazardous materials/wastes will have the appropriate health and safety training commensurate with the anticipated level of exposure.

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 short-term construction impacts regarding upset and accident-related hazards associated with the Energy Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

As noted above, although there is uncertainty as to the exact locations where new facilities could be constructed or where existing facilities could be reconstructed, these would likely occur within footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. Thus,

implementation of the Energy Sector recommendations would not be anticipated to result in locating facilities near schools, public (or public use) airports, private air fields, or wildlands; or on land included on a list of hazardous materials sites or impair implementation of or physically interfere with an adopted emergency response or evacuation plan. The handling of hazards materials would be required to comply with all applicable federal, State and local laws.

As discussed above, the Energy Sector recommendations could also result in construction of CCS facilities. Geologic sequestration involves the injection of CO_2 thousands of feet underground where it is trapped within the pore spaces of solid rock. US EPA requires that sequestration sites have confining subsurface zones, or layers of impermeable rock, to keep CO_2 from escaping into overlying geologic layers, ground water, or the surface (40 CFR 146.83(a)(2)). Under the geologic sequestration rule, US EPA requires that potential geologic sequestration sites be thoroughly studied to protect the safety and security of the project. Geologic sequestration is not allowed where unsuitable subsurface conditions exist, and all underground injection projects must obtain permits to ensure the protection of underground drinking water sources or the surface. (40 CFR 146.82(a)(3)) (EPA 2010b).

CCS systems may include EOR. Technologies to implement CCS/EOR projects are evolving. For instance, projects are currently underway to consider mobility control of the injected CO_2 using novel foams and gels (DOE 2014). In addition, use of industrial sources of CO_2, such as coal-based energy producers and fertilizer manufacturing plants, could contain impurities (i.e., injected agents may include other constituents, rather than only pure CO_2, that could become contaminants). Although operators would take steps to ensure that pressure is maintained to trap sequestered CO_2 and other potential constituents, the risk would remain that some emissions could be released into the air, soil, aquifers, or surface waterways as a result of unidentified and/or poorly abandoned wells or other pathways (e.g., natural fractures).

The regulatory framework for EOR is also evolving. While the development of an environmentally protective, regulatory framework to address EOR project implementation in California is ongoing, specific requirements and limitations have not yet been fully established, so potential risks of hazards and contamination cannot be entirely dismissed.

Upon extraction of oil, there is a potential for accidental release during the transport of fuel. 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 still remains for a significant release of hazardous materials into the environment (resulting in either a hazard event or contamination of soil, water, and/or air). Consequently, long-term operations 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.

The long-term operational impact associated with the Energy Sector on hazards and hazardous materials would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 9.a(2)

The Regulatory Setting in Attachment 2 includes applicable laws and regulations in regards to hazards and hazardous materials. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a "project" under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes.

Permits and/or agreements to reduce potential hazards and hazardous materials impacts could include, but are not limited to, Underground Injection Control (UIC) permits administered pursuant to the SDWA at the federal and State and levels. The US EPA issues Class VI permits under these regulations, which apply to injections wells that are drilled for the sole purpose of CO_2 injection in an underground formation as part of a CCS project, without any other intended purpose. DOGGR issues Class II permits under regulatory authority granted by US EPA pursuant to UIC regulations. Class II permits apply to injection wells created for the purpose of extracting oil and gas, including injection wells used for EOR methods that could also be used for the purpose of CO_2 sequestration as part of a CCS project. Furthermore, ARB will develop regulations, and complete all pertinent environmental review, to limit the types of technologies available for use during project operation.

To obtain these permits, the project proponent would be required to conduct various evaluations, such as engineering studies, geologic study, and injection plans. Requirements for these permits are likely to include: isopach maps, cross sections, and a representative electric log that identifies all geologic units, formations, freshwater aquifers, and oil or gas zones. In addition, CEQA and/or other necessary regulatory processes would be completed to address and mitigate potential environmental effects. Because these actions would address inspection, enforcement, mechanical integrity testing, plugging and abandonment oversight, data management, public outreach, and potential environment effects, this impact could be reduced to a less than significant level.

Consequently, this EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potentially significant long-term operational impact regarding upset and accident-related hazards could be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 9.b

Short-Term Construction-Related Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of hazard impacts associated with the Transportation Sector would be of similar type and magnitude as those discussed under Impact 9.a under the Energy Sector.

The short-term construction-related impact associated with the Transportation Sector on hazards and hazardous materials would be potentially significant.

The impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 9.b: Implement Mitigation Measure 9.a(1)

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 this 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, while impacts could 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 short-term construction hazard impacts associated with the Transportation Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Compliance responses associated with the Transportation Sector includes implementation of LCFS, which incents change in the types of fuels used in vehicles. All internal combustion engine vehicles have the potential to release chemicals into the environment. These releases may occur as emissions to the air during fuel combustion, as well as through spills and leaks during fueling and vehicle use. Several studies have determined that use of biodiesel (i.e., a low-carbon fuel), instead of conventional diesel may be expected to exhibit large reductions in hydrocarbons, PM, and CO emissions. However, biodiesel is produced from a variety of feedstocks, including: common vegetable oils (soybean, palm, rapeseed/canola, sunflower, safflower, algae, cottonseed, peanut), animal fats, and waste oils (used frying oils, trap grease). The content of the oils determines the level of pretreatment needed to produce usable fuel formulations.

In addition, to providing a stable, useful, and reliable fuel, additive chemicals would need to be introduced into biodiesel blends to control oxidation, corrosion, foaming, cold temperature flow properties, biodegradation, water separation, and NO_X formation. (See Long-Term Operational Impact 3.b). The specific chemicals and amounts that could be used have not been well-defined at the time of public review of the Proposed Update. Thus, because the types of chemicals that could be used are currently unknown, the potential for release of hazardous materials during the use of low-carbon fuels, cannot be entirely precluded.

However, the LCFS program is being developed with consideration of recommendations provided in the Biodiesel Multimedia Evaluation report (Cal/EPA 2013). This report has concluded that, in general, life cycle pollutant emissions from pure biodiesel are considerably less toxic than life cycle pollutant emissions from petroleum-derived fuels. In addition, additives that could be used in low-carbon fuels are likely to be similar to those used in existing fuels (i.e., ultra-low-sulfur diesel), and are, therefore, not anticipated to pose a substantially increased risk to the environment. Furthermore, as the biodiesel industry and market become more developed, additional evaluations will be prepared to address issues including:

- Investments to improve the knowledge base,
- Formulation of processes used to collect and manage new information,
- Formulation of processes to evaluate and communicate uncertainty, and
- Adjustment of the risk assessment process to mitigate the practical impacts of uncertainty on decision-making.

Thus, because research is ongoing, and the proposed program and analysis will address long-term operational impacts associated with low-carbon fuels would be minimized to the extent feasible, it can be assumed that fuel formulations would pose a similar level of hazards risk compared to existing fuels.

Long-term operational hazards and hazardous materials impacts associated with the Transportation Sector would be **less than significant**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 9.c

Short-Term Construction-Related Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial conversion of agriculture or forest lands.

Short-term construction-related impacts under the Agriculture Sector associated with the transport, use, and disposal of hazardous materials would be **less than significant**.

Long-Term Operational Impacts

Unintentional releases of biogas from dairy digester facilities or pipelines could pose risks to human health and safety. For example, biogas could be released from a leak or rupture of the digester facility or one of the pipe segments. If the gas reaches a combustible mixture and an ignition source is present, a fire and/or explosion could occur, resulting in possible injuries and/or deaths.

Compliance with existing safety regulations and widely-accepted industry standards would minimize the hazard to the public and the environment. With respect to the flaring of biogas and potential fire hazards associated with the storage and transport of CH_4 and small quantities of other materials used in operations, the National Fire Protection Agency (NFPA) has established standards for fire protection which would be applicable to the construction of dairy digester and co-digester facilities. These standards have been successfully implemented by numerous waste water treatment facilities across the country. Construction and operation of facilities would comply with the California fire code, local building codes (including requirements for the installation of fire suppression systems), and gas pipeline regulations. The local fire agency would be responsible for enforcing the provisions of the fire code. The CPUC regulates the safety of gas transmission pipelines. Standard safety measures for anaerobic treatment facilities that would minimize the potential for exposure to biogas include leak detection systems, warning signals, and safety flares to reduce excess gas capacity. If released to the environment, CH_4 would be dispersed rapidly in air, minimizing exposure-related hazards.

Dairies in the Central Valley Water Board region are predominantly located in agricultural areas that are not within high wildfire hazard zones. In addition, due to odor and other siting considerations, dairy digester and co-digester facilities would not be constructed immediately adjacent to residential structures. Compliance with existing laws and regulations would reduce the potential for fires and explosions associated with digester and co-digester facilities; however, in the unlikely event of a fire, the potential to expose people or structures to a significant risk involving fires is low.

Issues associated with proximity to hazardous materials sites (e.g., for schools and airports) would be of similar types and magnitude as described under Impact 9.a.

Therefore, hazards and hazardous materials long-term operational impacts associated with the Agriculture Sector would be **less than significant**.

d) Water Sector

Impact 9.d

Short-Term Construction-Related Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of hazard impacts associated with the Water Sector would be of similar type and magnitude as those discussed under Impact 9.a under the Energy Sector.

The short-term construction-related impact associated with the Water Sector on hazards and hazardous materials would be potentially significant.

The impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 9.d: Implement Mitigation Measure 9.a(1)

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 this 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, while impacts could 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 short-term construction hazard impacts associated with the Water Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Recommended actions associated with the Water Sector could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. These types of facilities are typical features within urban settings, and do not pose a substantial risk to the general public. While this process could expose workers to hazards if an accident were to occur, it can be assumed that systems would be built, operated, and maintained to meet applicable federal, State, and local regulations pertaining to general workplace safety (e.g., OSHA).

Impacts related to operational emissions that could be hazardous (i.e., CAPs and TACs), are discussed under Impact 3.f.

Thus, long-term operational impacts on hazards and hazardous materials associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 9.e

Short-Term Construction-Related Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as

increased recycling, development of waste-to-energy facilities, and installation of new CH_4 control devices at landfills.

The types of hazard impacts associated with the Waste Management Sector would be of similar type and magnitude as those discussed under Impact 9.a under the Energy Sector.

The short-term construction-related impact associated with the Waste Management Sector on hazards and hazardous materials would be potentially significant.

The impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 9.e: Implement Mitigation Measure 9.a(1)

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 this 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, while impacts could 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 short-term construction hazard impacts associated with the Waste Management Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Operation and maintenance of anaerobic digestion facilities would involve the transport, use, storage and disposal of hazardous materials such as fuels, lubricants and hydraulic fluids for vehicles and onsite equipment. The biogas produced from the anaerobic digestion process could be used for internal combustion or flared. Biogas presents an inhalation hazard that, if breathed in high concentration, can result in serious injury or death.

Handling of hazardous materials and hazardous wastes is covered by federal and State laws that minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (Cal/OSHA) is responsible for developing and enforcing workplace safety standards, including the handling and use of hazardous materials, including gases. Workers must be trained to understand the hazards and appropriate work procedures associated with confined spaces, flammable gases, etc. Businesses that use hazardous materials are required to submit a Hazardous Materials Business Plan to the local California Unified Program Agency, which performs inspections to address compliance with hazardous materials labeling, training, and storage regulations.

Transportation of hazardous materials is regulated by the US Department of Transportation and Caltrans. Together, federal and State agencies determine driver-training requirements, load labeling procedures, and container specifications designed to minimize the risk of accidental release. Hazardous wastes must be segregated, sampled and disposed of at appropriately licensed landfill facilities.

In addition, operation and maintenance of anaerobic digestions facilities would involve the transport, use, storage and disposal of hazardous materials such as fuels, lubricants and hydraulic fluids for vehicles and onsite equipment. If biogas conditioning is required for use either in a fuel cell or production of liquefied biogas, scrubber facilities would be needed to clean the biogas to remove sulfides. Flushing of the scrubbers would produce sulfide effluent that would require appropriate disposal. Biogas presents an inhalation hazard that, if breathed in high concentration, can result in serious injury or death. Biogas itself is not explosive and will not burn unless oxygen is available at low concentrations. Handling of hazardous materials and hazardous wastes is covered by federal and State laws that minimize worker safety risks from both physical and chemical hazards in the workplace. Cal/OSHA is responsible for developing and enforcing workplace safety standards, including the handling and use of hazardous materials, including gases. Workers must be trained to understand the hazards and appropriate work procedures associated with confined spaces, flammable gases, etc. Businesses that use hazardous materials are required to submit a Hazardous Materials Business Plan to the local CUPA, which complies with hazardous materials labeling, training, and storage regulations.

Issues associated with proximity to hazardous materials sites (e.g., for schools and airports) would be of similar types and magnitude as described under Impact 9.a.

Because numerous laws and regulations govern the transport, use, storage, handling and disposal of hazardous materials to reduce the potential hazards associated with biogas, this long-term operational impacts associated with the Waste Management Sector would be **less than significant**.

f) Natural and Working Lands Sector

Impact 9.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of

croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommended actions under the Natural and Working Lands Sector could cause an increase in the construction and operation of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations of appropriate zoning.

The types of hazard impacts associated with the Natural and Working Lands Sector would be of similar type and magnitude as those discussed under Impact 9.a under the Energy Sector.

The short-term construction-related impact associated with the Natural and Working Lands Sector on hazards and hazardous materials would be potentially significant.

The impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 9.f: Implement Mitigation Measure 9.a(1)

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 this 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, while impacts could 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 short-term construction hazard impacts associated with the Natural and Working Lands Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Reasonably foreseeable compliance responses associated with the Natural and Working Lands Sector include construction and operation of new biomass facilities. Biomass facilities convert biomass, such as woody wastes from forest residues to useful steam, heat, or combustible gases. The two basic types of conversions systems consist of gasification and direct combustion for electricity generation. Gasification systems generate electricity through combustion of syngas (i.e., synthetic gas produced from the conversion of organic solids and liquids under heat and controlled air or oxygen); and

direct combustion systems burn biomass in a furnace, which supplies heat to a boiler that produces steam. Syngas, from gasification systems, are used to generate electricity in an internal combustion engine or turbine. Steam, from direct combustion systems, generates electricity through the use of a steam turbine. While this process could expose workers to hazards if an accident were to occur, it can be assumed that systems would be built, operated, and maintained to meet applicable federal, State, and local regulations pertaining to general workplace safety (e.g., OSHA).

Impacts related to operational emissions that could be hazardous (i.e., CAPs and TACs), are discussed under Impact 3.f.

Thus, long-term operational impacts on hazards and hazardous materials associated with the Natural and Working Lands Sector would be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 9.g

Short-Term Construction-Related Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of hazard impacts associated with the Short-Lived Climate Pollutants Sector would be of similar type and magnitude as those discussed under Impact 9.a under the Energy Sector.

The short-term construction-related impact associated with the Short-Lived Climate Pollutants Sector on hazards and hazardous materials would be potentially significant.

The impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 9.g: Implement Mitigation Measure 9.a(1)

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 this 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, while impacts could 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 short-term construction hazard impacts associated with the Short-Lived Climate Pollutants Sector would be potentially significant and unavoidable.

Long-Term Operational Impacts

Implementation of low GWP compliance measures may result in the use or increase in use of hazardous chemicals. Depending on the chemical used, there may be an increased risk to public safety. For example, while cyclopentane and cyclopentane blends have a lower GWP, cyclopentane is highly flammable in its pure form; however, once foamed, it is no more hazardous than other blowing agents currently in use. As with any manufacturing processes, a wide variety of redundant engineering and operational safeguards are typically integrated, along with compliance with federal, state, and local environmental and health and safety laws and regulations address the management and use of flammable and toxic chemicals.

Some potential heat transfer fluids that could be used to replace high-GWP refrigerants, such as propane and ammonia, are highly flammable. Heavier-than-air refrigerants can concentrate at floor levels and displace breathable oxygen. Inhalation of certain fumes, during accidental release, can also cause human health effects ranging from nausea to death. However, Chapter 11 of the California Mechanical Code regulates the use of refrigeration systems, equipment, and devices, including the replacement of parts, alterations, and substitution of different refrigerants. This includes requirements for ventilation and exhaust systems, emergency control systems, and alarms. Operational impacts associated with proximity (e.g., for schools and airports) to hazardous materials sites would be similar to those described under Impact 9.a.

Long-term operational impacts associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

h) Green Buildings

Impact 9.h

Short-Term Construction-Related Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

The types of hazard impacts associated with Green Buildings would be of similar type and magnitude as those discussed under Impact 9.a under the Energy Sector.

The short-term construction-related impact associated with Green Buildings on hazards and hazardous materials would be potentially significant.

The impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 9.h: Implement Mitigation Measure 9.a(1)

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 this 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, while impacts could 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 short-term construction hazard impacts associated with Green Buildings would be **potentially significant and unavoidable**.

Long-Term Operational impacts

While most technologies that could be used would not require the use of substantial hazardous materials, the production of photovoltaic devices can involve the use of some toxic and explosive gases, corrosive liquids, and suspected carcinogenic compounds. The magnitude of potential effects will vary based on the materials' toxicological properties, and the intensity, frequency, and duration of human exposure. The potential for human exposure to these materials can occur during the manufacturing process, from the leaching of cracked or broken modules, or from the combustion of modules.

The greatest possibility of human health risks associated with photovoltaic devices is related to manufacturing, rather than installation, of these devices. Because of the higher risks of worker exposure, extensive work has been conducted on methods to reduce the hazards to manufacturing plant workers. Worker safety is also regulated by the federal Occupational Safety and Health Administration (OSHA) and similar state agencies. OSHA sets standards for allowable chemical concentrations that workers can be exposed to over an 8-hour work day, in addition to the maximum allowable concentrations without personal protective equipment.

Potential human health risks could occur from the leaching of materials from broken photovoltaic modules. Leaching from cracked or broken modules may occur while the modules are still in service or after they have been disposed of. The primary chemicals of concern from the leaching of photovoltaic modules are heavy metals such as

cadmium and selenium. Modules leaching metals onto rooftops of residential houses or commercial buildings appear to pose little risk to human or environmental health (CEC 2003).

Thus, while chemicals contained within, and used during the production of solar panels pose risks to human health, existing laws and regulations (e.g., OSHA) would reduce the risk of exposure to protect against substantial human health risks are reduced to the extent feasible.

Operational impacts associated with proximity (e.g., for schools and airports) to hazardous materials sites would be similar to those described under Impact 9.a.

Long-term operational hazards and hazardous materials, associated with Green Buildings would be **less than significant**.

i) Cap-and-Trade Regulation

Impact 9.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. The use of hazardous materials is common practice in industrial settings. Implementation of compliance responses could include the use of hazardous materials, but this would be considered simply an extension of business as usual for most covered entities, mitigated by existing practices and regulations, and thus considered less than significant.

Offset projects implemented under the proposed offset protocols may result in the use or transport of hazardous materials that require special handling and disposal. All projects would be required to comply with established local, state, and federal laws pertaining to the use, storage, and transportation of these materials. Assuming compliance with applicable laws and regulations, the impacts would be less than significant.

Impacts related to CCS are described above under the Energy Sector.

10. Hydrology and Water Quality

a) Energy Sector

Impact 10.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

This increase in demand could require construction of new and/or modified manufacturing plants. Although it is reasonably foreseeable that construction activities could occur, the location and extent construction activities related to new or modified manufacturing facilities cannot be determined at this time.

Construction activities could require disturbance of undeveloped areas, 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. Specific construction projects would be required to comply with applicable erosion, water quality standards, and waste discharge requirements (e.g., NPDES, SWPPP). With respect to depleting groundwater supplies, impairing quality, and runoff issues, construction new facilities would not be anticipated to result in substantial demands due to the nature of associated activities.

Short-term construction-related impacts to hydrologic resources associated with the Energy Sector would be potentially significant.

Impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations in regards to hydrology and water quality. ARB does not have the authority to require

implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or mitigate hydrology and water quality-related impacts include the following:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance responses to new regulations would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all feasible mitigation identified in the environmental document to reduce or substantially lessen the potentially significant impacts associated with altering drainage patters, flooding, and inundation by seiche, tsunami, or mudflow. The definition of actions required to mitigate potentially significant hydrology and water quality impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
    - Under the oversight of the local lead agency, prior to issuance of any construction permits, the proponents for the proposed renewable energy project would prepare a stormwater drainage and flood control analysis and management plan. The plans would be prepared by a qualified professional and would summarize existing conditions and the effects of project improvements, and would include all appropriate calculations, a watershed map, changes in downstream flows and flood elevations, proposed on- and off-site improvements, features to protection downstream uses, and property and drainage easements to accommodate downstream flows from the site. Project drainage features would be designed to protect existing downstream flow conditions that would result in new or increased severity of offsite flooding.
    - Establish drainage performance criteria for off-site drainage, in consultation with county engineering staff, such that project-related drainage is consistent with applicable facility designs, discharge rates, erosion protection, and routing to drainage channels, which could be accomplished by, but is not limited to: (a) minimizing directly connected impervious areas; (b) maximizing permeability of the site; and, (c)

stormwater quality controls such as infiltration, detention/retention, and/or biofilters; and basins, swales, and pipes in the system design.

- The project proponent would design and construct new facilities to provide appropriate flood protection such that operations are not adversely affected by flooding and inundation. These designs would be approved by the local or State land use agency. The project proponent would also consult with the appropriate flood control authority on the design of offsite stream crossings such that the minimum elevations are above the predicted surface-water elevation at the agency's designated design peak flows. Drainage and flood prevention features shall be inspected and maintained on a routine schedule specified in the facility plans, and as specified by the county authority.
- As part of subsequent project-level planning and environmental review, the project proponent shall coordinate with the local groundwater management authority and prepare a detailed hydrogeological analysis of the potential project-related effects on groundwater resources prior to issuance of any permits. The proponent shall mitigate for identified adverse changes to groundwater by incorporating technically achievable and feasible modifications into the project to avoid offsite groundwater level reductions, use alternative technologies or changes to water supply operations, or otherwise compensate or offset the groundwater reductions.

Mineral extraction and mining activities within the United States would be required to comply with the provisions of the Clean Water Act and the natural resource protection and land reclamation requirements of the appropriate state and federal land managers. The strongest protections for hydrologic resources are found in the Bureau of Land Management (BLM) and US Forest Service mining permit conditions. All projects on federal lands would be required to provide disclose potential impacts as required by the National Environmental Policy Act. On BLM lands, all mining operations are subject to monitoring by the BLM to protect against unnecessary or undue degradation, and that all operators are responsible for fully reclaiming the area of their claim. Reclamation requires restoration of disturbed areas to stable, self-sustaining, and productive conditions which comply with the land-use plan for the area (EPA 1994). The US Forest Service enforces similar mining reclamation standards for the land it manages. Reclamation requirements for mining operations on private lands vary from state to state. In some developing countries which supply mineral resources to the United States, environmental oversight and requirements for reclamation are effectively nonexistent (Vidal *et* al. 2013).

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 short-term construction-related impacts associated with the Energy Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

New manufacturing facilities and renewable energy projects could be located 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. 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.

Iron, copper, and aluminum are required in large quantities for the manufacturing of wind turbines and photovoltaic panels. Rare metals are also required such as lithium used for lithium-ion batteries to power electric vehicles and store energy for delayed release. Analysts predict that the global production of aluminum and copper will be required to increase 5 – 18 percent annually in order to meet global targets for wind and solar energy (Vidal *et* al. 2013). The Copper Development Association projects that the five year demand resulting from renewable energy integration and grid energy storage within the US could exceed 3,000 tons of copper (CDA 2012). The risk of water quality degradation resulting from the mining process used to extract these minerals is dependent on the environmental oversight of the area where the mining occurs. In general, contamination of groundwater can occur during the process of leaching mineral ore from crushed bedrock, infiltration of unlined tailing impoundments, and from acidified mine drainage at abandoned sites. Surface waters can be contaminated by runoff from exposed spoil and overburden piles. Surface-water discharge and seepage from tailings ponds and dams can also contain high concentrations of heavy metals (EPA 1994).

In addition, some areas that would be typical for renewable energy supplies (e.g., the desert) rely on groundwater resources. These water supplies could be required for evaporative cooling, washing of solar panels, dust control, and domestic use by the workforce. These facilities may also require new compacted or paved impervious surfaces that could increase the amount of stormwater runoff. Additional stormwater runoff may contribute to localized drainage-related problems, such as increased drainage channel flows and stream flows, potential increases or exceedances of channel capacities leading to flooding, increased erosion and sedimentation, or damage from inundation of property and structures from increase drainage volumes.

Finally, reasonably foreseeable compliance responses associated with the Energy Sector could result in implementation of CCS/EOR projects. Technologies to implement CCS/EOR projects are evolving. For instance, projects are currently underway to consider mobility control of the injected CO_2 using novel foams and gels (DOE 2014). In

addition, use of industrial sources of CO_2, such as coal-based energy producers and fertilizer manufacturing plants, could contain impurities (i.e., injected agents may include other constituents, rather than only pure CO_2, that could become contaminants). Although operators would take steps to ensure that pressure is maintained to trap sequestered CO_2 and other potential constituents, the risk would remain that some emissions could be released into the air, soil, aquifers, or surface waterways as a result of unidentified and/or poorly abandoned wells or other pathways (e.g., natural fractures).

The regulatory framework for EOR is also evolving. While the development of an environmentally protective, regulatory framework to address EOR project implementation in California is ongoing, specific requirements and limitations have not yet been fully established, so potential risks of contamination cannot be entirely dismissed.

Long-term operational impacts to hydrologic resources associated with the Energy Sector would be potentially significant.

Operational impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.b(1): Implement Mitigation Measure 10.a

Mitigation Measure 10.b(2)

The Regulatory Setting in Attachment 2 includes applicable laws and regulations in regards to hydrology and water quality. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes.

Permits and/or agreements to reduce potential hydrology and water quality impacts could include, but are not limited to, Underground Injection Control (UIC) permits administered pursuant to the SDWA at the federal and State and levels. The US EPA issues Class VI permits under these regulations, which apply to injections wells that are drilled for the sole purpose of CO_2 injection in an underground formation as part of a CCS project, without any other intended purpose. DOGGR issues Class II permits under regulatory authority granted by US EPA pursuant to UIC regulations. Class II permits apply to injection wells created for the purpose of extracting oil and gas, including injection wells used for EOR methods that could also be used for the purpose of CO_2 sequestration as part of a CCS project. Furthermore, ARB will develop regulations, and complete all pertinent environmental review, to limit the types of technologies available for use during project operation.

To obtain these permits, the project proponent would be required to conduct various evaluations, such as engineering studies, geologic study, and injection plans. Requirements for these permits are likely to include: isopach maps, cross sections, and a representative electric log that identifies all geologic units, formations, freshwater aquifers, and oil or gas zones. In addition, CEQA and/or other necessary regulatory processes would be completed to address and mitigate potential environmental effects. Because these actions would address inspection, enforcement, mechanical integrity testing, plugging and abandonment oversight, data management, public outreach, and potential environment effects, this impact could be reduced to a less than significant level.

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 long-term operational impacts to hydrologic resources associated with the Energy Sector would be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 10.b

Short-Term Construction-Related and Long-Term Operational Impacts

The recommended actions associated with the Transportation Sector could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts to hydrologic resources related to the manufacturing of these technologies associated with the Transportation Sector would be of similar type and magnitude as those discussed under Impact 10.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to hydrologic resources associated with the Transportation Sector would be potentially significant.

Impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.b: Implement Mitigation Measure 10.a

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 this 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, while impacts could 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 short-term construction-related impacts to hydrologic resources associated with the Transportation Sector would be **potentially significant and unavoidable.**

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 10.c

Short-Term Construction-Related Impacts and Long-Term Operational

Compliance responses associated with the recommended actions in the Agriculture Sector would incentivize efficient and precise use of nitrogen fertilizers and irrigation water, conservation tillage practices, and land use planning strategies that protect croplands, forests, rangelands, and wetlands. These programs would reduce the over application of nitrogen fertilizers which, combined with excessive irrigation, can result in the degradation of surface and groundwater resources.

Implementation of reduced tillage and conservation tillage programs would reduce sediment loading in runoff and would protect surface waters. Overall, implementation of recommendations actions in the Agriculture Sector would increase conservation of hydrologic resources.

Short-term construction-related and long-term operational impacts to hydrologic resources associated with the Agriculture Sector would be **beneficial**.

d) Water Sector

Impact 10.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types impacts on hydrology and water quality associated with the Water Sector would be of similar type and magnitude as those discussed under Impact 10.a for the Energy Sector.

Short-term construction-related and long-term operational impacts to hydrologic resources associated with the Water Sector would be potentially significant.

Impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.d: Implement Mitigation Measure 10.a

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 this 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, while impacts could 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 short-term construction-related and long-term operational impacts to hydrologic resources associated with the Water Sector would be **potentially significant and unavoidable**.

e) Waste Management Sector

Impact 10.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the recommended actions in the Waste Management sector could require construction and operation of new, or expansion of existing, composting and anaerobic digestion facilities. With the exception water quality impacts related to mineral extraction, impacts to hydrologic resources resulting from the Water Management recommendations would be of similar type and magnitude as those discussed under Impact 10.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to hydrologic resources associated with the Waste Management Sector would be potentially significant.

Impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.e: Implement Mitigation Measure 10.a

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 this 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, while impacts could 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 short-term construction-related and long-term operational impacts to hydrologic resources associated with the Waste Management Sector would be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 10.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

With the exception of water quality impacts related to mineral extraction, impacts to hydrologic resources resulting from the Natural and Working Lands Sector recommendations would be of similar type and magnitude as those discussed under Impact 10.a under the Energy Sector.

Short-term construction-related impacts to hydrologic resources associated with the Natural and Working Lands Sector would be potentially significant.

Impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.f: Implement Mitigation Measure 10.a

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 this 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, while impacts could 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 short-term construction-related impacts to hydrologic resources would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Compliance responses associated with the recommended actions in the Natural and Working Lands Sector could involve development of programs designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. These actions could reduce the amount of contaminant and sediment laden urban runoff that reaches surface waters. These actions would contribute to increased conservation of hydrologic resources.

Long-term operational impacts on hydrologic resources associated with the Natural and Working Land Sector would be **beneficial**.

g) Short-Lived Climate Pollutants Sector

Impact 10.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriate zoned to accommodate them.

With the exception water quality impacts related to mineral extraction, impacts to hydrologic resources associated with the Short-Lived Climate Pollutants Sector, resulting from these recommendations, would be of similar type and magnitude as those discussed under Impact 10.a under the Energy Sector.

Short-term construction-related and long-term operational impacts to hydrologic resources associated with the Short-Lived Climate Pollutant Sector would be potentially significant.

Impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.g: Implement Mitigation Measure 10.a

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 this 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, while impacts could 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 short-term construction and long-term operational impacts to hydrologic resources resulting from the development new facilities or modification of existing facilities would be **potentially significant and unavoidable**.

h) Green Buildings

Impact 10.h

Short-Term Construction-Related Impacts

The recommended actions for Green Buildings include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Reasonably foreseeable compliance responses include increased demand for renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and funding of carbon offset technologies, including solar PV or wind turbine farms, which could require new or expanded manufacturing facilities or renewable energy projects.

These activities associated with Green Buildings would result in construction-related impacts to hydrologic resources similar in type and magnitude to those discussed under Impact 10.a under the Energy Sector.

Short-term construction-related impacts to hydrologic resources associated with Green Buildings would be potentially significant.

Construction-related impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.h: Implement Mitigation Measure 10.a

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 this 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, while impacts could 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 short-term construction-related impacts to hydrologic resources associated with Green Buildings would be **potentially significant and unavoidable**.

Long-Term Operational- Impacts

Operation of renewable energy projects would result in the same types of operational impacts as discussed under Impact 10.a.

Long-term operational impacts to hydrologic resources associated with Green Buildings would be potentially significant.

Operational impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, state, and local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 10.h: Implement Mitigation Measure 10.a

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 this 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, while impacts could 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 long-term operational impacts to hydrologic resources associated with Green Buildings would be **potentially significant and unavoidable**.

i) Cap-and-Trade Regulation

Impact 10.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities involve construction, grading and trenching which have the potential to result in adverse soil erosion, resulting in sedimentation and degradation of

local waterways. The FED identified recognized measures that exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that this impact may be potentially significant and unavoidable.

Implementation of projects under the ODS Offset Protocol would have no adverse impacts on hydrology and water quality. Implementation of projects under the Livestock Offset Protocol would include the construction of digesters that would be subject to regulations which are considered sufficient to mitigate potential impacts to hydrology and water quality to a less than significant level. Implementation of projects under the Urban Forest Offset Protocol would result in only minor soil disturbance resulting in less than significant impacts to hydrology or water quality. Implementation of projects under the Forest Offset Protocol would not increase total forest activities, but could shift activities to projects that increase carbon sequestration. Because the overall level of forest activities would not change, the potential to adversely impact hydrology and water quality would not change. This impact would be less than significant.

Impacts related to CCS are described above under the Energy Sector.

11. Land Use and Planning

a) Energy Sector

Impact 11.a

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

New facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. In some cases, new facilities could be located on public lands; for instance, a

solar PV farm could be located in desert or grassland areas. However, coordination with the appropriate agencies with land use authority would be required, and the appropriate level of environmental review would be completed before installation could occur. Thus, implementation of new regulations and/or incentive measures would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts associated with the Energy Sector would be **less than significant**.

b) Transportation Sector

Impact 11.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities. New facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. Thus, implementation of new regulations and/or incentive measures would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts associated with the Transportation Sector would be **less than significant**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 11.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest

lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. Planning efforts could increase conservation of agricultural and forest lands. While conservation-oriented planning efforts may lead to indirect, beneficial environmental effects to various resources areas including, air quality, GHG emissions, and biology, they may not be consistent with existing, local or State land use goals and policies. However, planning efforts associated with the Agriculture Sector would be made in coordination with local, State, or federal jurisdictions. Thus, implementation of new regulations and/or incentive measures would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts associated with the Agriculture Sector would be **less than significant**.

d) Water Sector

Impact 11.d

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur.

The types of construction-related and long-term operational impacts on land use would be of similar type and magnitude as those discussed under Impact 11.a for the Energy Sector.

Short-term construction-related and long-term operational land use impacts associated with the Water Sector would be **less than significant**.

e) Waste Management

Impact 11.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

New facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. Thus, implementation of new regulations and/or incentive measures would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts associated with the Waste Management Sector would be **less than significant**.

f) Natural and Working Lands Sector

Impact 11.f

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

Planning efforts could increase green infrastructure, create interconnected lands, and limit future conversions of undeveloped lands. These types of planning efforts would generally avoid and/or mitigate environmental effects (i.e., environmental effects associated with GHG emissions). Further, these would likely be consistent, or

complement nearby habitat conservation plans and natural community conservation plans. While conservation-oriented planning efforts may lead to indirect, beneficial environmental effects to various resources areas including, air quality, GHG emissions, and biology, they may not be consistent with existing, local or State land use goals and policies. However, planning efforts associated with Natural and Working Land Sector recommendations would be made in coordination with local, State, or federal jurisdictions.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations of appropriate zoning.

New facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. Thus, implementation of new regulations and/or incentive measures would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts associated with the Natural and Working Lands Sector would be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 11.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them. New facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. Thus, implementation of new regulations and/or incentive measures would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

h) Green Buildings

Impact 11.h

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

New facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. Thus, implementation of new regulations and/or incentive measures would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts associated with Green Buildings would be **less than significant**.

i) Cap-and-Trade Regulation

Impact 11.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities would be consistent with the existing land use and would pose a less than significant land use and planning impact.

Implementation of projects under the ODS Offset Protocol would use existing facilities, representing a less than significant impact to land use and planning. Implementation of projects under the Livestock Offset Protocol would allow the construction of digesters in agricultural settings. Digesters are typically an allowed use in agricultural areas. As such, their construction would not conflict with existing land use plans, and thus would be a less than significant impact. Projects implemented under the Urban Forest Offset Protocol would not conflict with land use plans, resulting in a less than significant impact. Implementation of projects under the Forest Offset Protocol includes avoided conversion projects that could conflict with local land use plans that envision development or other uses of forested areas. The FED identified recognized measures that exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the impact described as possible conflicts between the “avoided conversion” element of the Forest Offset Protocol and land use plans may be potentially significant and unavoidable.

Impacts related to CCS are described above under the Energy Sector.

12. Mineral Resources

a) Energy Sector

Impact 12.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Although it is reasonably foreseeable that construction activities could occur, the location and extent construction activities related to new or modified manufacturing facilities cannot be determined at this time. However, new facilities would likely occur within existing footprints or in areas with consistent zoning, where original permitting

and analyses considered these issues. As a result, construction of new facilities and renewable resource projects would not affect the availability of a known mineral resource or recovery site.

Thus, short-term construction-related mineral resources impacts associated with the Energy Sector would **be less than significant**.

Long-Term Operational Impacts

Compliance with the recommended actions in the Energy Sector could result in increased demand for common (i.e. iron, copper, and aluminum) and rare (i.e. lithium) minerals. Increased demand could stimulate more aggressive mineral exploration as well as wider distribution of efficient and modern mining technologies. However, minerals are already used in a variety of products, including gasoline-powered vehicles. Implementation of recommended actions in the Energy Sector would not be expected to increase demand to the point that worldwide mineral resources could become exhausted and no longer available.

Thus, and long-term operational impacts on mineral resources, associated with the Energy Sector, would be **less than significant**.

b) Transportation Sector

Impact 12.b

Short-Term Construction-Related Impacts

The recommended actions associated with the Transportation Sector could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations.

The types of impacts to mineral resources related to the manufacturing of these technologies would be of similar type and magnitude as those discussed under Impact 10.a under the Energy Sector.

Thus, short-term construction-related mineral resources impacts associated with the Transportation Sector would be **less than significant**.

Long-Term Operational Impacts

Compliance with the recommended actions in the Transportation Sector could result in increased demand for common (i.e., iron, copper, and aluminum) and rare (i.e., lithium) minerals. Increased demand could stimulate more aggressive mineral exploration as well as wider distribution of efficient and modern mining technologies. However, minerals are already used in a variety of products, including gasoline-powered vehicles. Implementation of recommended actions in the Energy Sector would not be expected to increase demand to the point that worldwide mineral resources could become exhausted and no longer available (ARB 2012b).

Thus, and long-term operational impacts on mineral resources, associated with the Transportation Sector, would be **less than significant**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 12.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the recommended actions in the Agriculture Sector would incentivize efficient and precise use of nitrogen fertilizers and irrigation water, conservation tillage practices, and land use planning strategies that protect croplands, forests, rangelands, and wetlands. These programs are not expected to affect the availability of known mineral resources or recovery sites and would not increase demand for mineral resources.

Short-term construction-related and long-term operational mineral resources impacts associated with the Agriculture Sector would be **less than significant**.

d) Water Sector

Impact 12.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction-related and long-term operational impacts on mineral resources would be of similar type and magnitude as those discussed under Impact 10.a for the Energy Sector.

Short-term construction-related and long-term operational mineral resources impacts associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 12.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the recommended actions in the Waste Management Sector could result in construction of new, or expansion of existing, composting and anaerobic digestion facilities. New facilities would likely occur within existing footprints or in areas with consistent zoning, where original permitting and analyses considered these issues. As a result, construction of new facilities and renewable resource projects would not impact the availability of a known mineral resource or recovery site. Additionally, implementation of the Waste Management recommendations would not create increased demand for mineral resources.

The types of construction-related and operational impacts on mineral resources would be of similar type and magnitude as those discussed under Impact 10.a for the Energy Sector.

Short-term construction-related and long-term operational mineral resources impacts associated with the Waste Management Sector would be **less than significant**.

f) Natural and Working Lands Sector

Impact 12.f

Short-Term Construction-Related Impacts and Long-Term Operational

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

Compliance responses associated with the recommended actions in the Natural and Working Land Sector could involve development of programs designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Additionally, the recommendations for the Natural and Working Lands sector could result in new demand for the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction-related and long-term operational impacts on mineral resources would be of similar type and magnitude as those discussed under Impact 10.a for the Energy Sector.

Short-term construction-related and long-term operational mineral resources impacts associated with the Natural and Working Lands Sector would be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 12.g

Short-Term Construction-Related Impacts and Long-Term Operational

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs.

The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriate zoned to accommodate them.

The types of construction-related and long-term operational impacts on mineral resources would be of similar type and magnitude as those discussed under Impact 10.a for the Energy Sector.

Short-term construction-related and long-term operational mineral resources impacts associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

h) Green Buildings

Impact 12.h

Short-Term Construction-Related Impacts

The recommended actions for Green Buildings include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Reasonably foreseeable compliance responses include increased demand for renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and funding of carbon offset technologies, including solar PV or wind turbine farms, which could require new or expanded manufacturing facilities or renewable energy projects. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

These activities would result in impacts to mineral resources similar in type and magnitude to those discussed under Impact 10.a under the Energy Sector.

Short-term construction-related mineral resources impacts associated with Green Buildings would be **less than significant**.

Long-Term Operational Impacts

Implementation of a compliance response that would require the long-term construction of ZNE and zero-net carbon buildings would require on-going mining activities to produce various renewable energy systems. For instance, mineral resources would be needed to produce solar panels to be used in ZNE homes. Metals such as cadmium, gallium, germanium, indium, selenium, and tellurium are important mineral materials used in current photovoltaic cell technology. Most of the world's primary supply of these mineral commodities is recovered as byproducts from ores processed mainly for the purpose of producing aluminum, copper, lead, and zinc and, in the case of germanium, from ash derived from burning coal for the production of energy. In some cases, the refined metals originate in the countries in which they are mined, while in other cases, intermediate products containing the metals and refined metals are recovered by processers located in other countries. Assuming that the modest rate of market penetration of electricity from photovoltaic cells and competing markets increases

demand for cadmium, gallium, and germanium, the resulting new demand can be met in relatively quick order with the expansion of existing recovery circuits or the addition of new circuits. It is very unlikely that, under most scenarios, the need would arise to mine more bauxite, copper, and zinc ore or to burn more coal to satisfy anticipated material requirements to meet the photovoltaic-generated demand for these mineral materials. For other metals, such as indium, selenium, and tellurium, targeted mineral exploration and improvements in metallurgical recoveries are likely to be needed to meet demand requirements. Substitution for these materials in non-photovoltaic applications could also “free up” supply. Conversely, however, other new applications can produce supply constraints or increase metal prices and place pressure on their use in photovoltaic technology (USGS 2010).

It is not anticipated that there will be any long-term material constraints that would prevent the development of a substantial amount of energy from photoelectric cells. Reserve estimates are not static; although a particular metal might be considered rare and scarce, if a profit can be made from its recovery, then there will likely be no long-term shortage. Technological advancements driven by the desire to produce energy at a lower cost will likely result in increases in efficiency requiring smaller amounts of these metals per unit of energy produced, substitution with other materials, and other advancements in science (USGS 2010).

Long-term operational mineral resources impacts associated with the Green Building Sector would be **less than significant**.

i) Cap-and-Trade Regulation

Impact 12.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

As summarized above under Impact 7.i, the 2020 FED concluded that mineral resources impacts associated with the Cap-and-Trade Regulations would be less than significant for the compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels and implementing maintenance and process changes as well as implementation of projects under all the offset protocols.

Impacts related to CCS are described above under the Energy Sector.

13. Noise

a) Energy Sector

Impact 13.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Construction noise levels that could result from reasonably foreseeable compliance responses would fluctuate depending on the particular type, number, size, and duration of usage for the varying equipment. The effects of construction noise largely depend on the type of construction activities occurring on any given day, noise levels generated by those activities, distances to noise sensitive receptors, and the existing ambient noise environment in the receptor's vicinity. Construction generally occurs in several discrete stages, each phase requiring a specific complement of equipment with varying equipment type, quantity, and intensity. These variations in the operational characteristics of the equipment change the effect they have on the noise environment of the project site and in the surrounding community for the duration of the construction process.

To assess noise levels associated with the various equipment types and operations, construction equipment can be considered to operate in two modes, mobile and stationary. Mobile equipment sources move around a construction site performing tasks in a recurring manner (e.g., loaders, graders, dozers). Stationary equipment operates in a given location for an extended period of time to perform continuous or periodic operations. Operational characteristics of heavy construction equipment are additionally typified by short periods of full-power operation followed by extended periods of operation at lower power, idling, or powered-off conditions.

Additionally when construction-related noise levels are being evaluated, activities that occur during the more noise-sensitive evening and nighttime hours are of increased concern. Because exterior ambient noise levels typically decrease during the late

evening and nighttime hours as traffic volumes and commercial activities decrease, construction activities performed during these more noise-sensitive periods of the day can result in increased annoyance and potential sleep disruption for occupants of nearby residential uses.

The site preparation phase typically generates the most substantial noise levels because of the on-site equipment associated with grading, compacting, and excavation, which uses the noisiest types of construction equipment. Site preparation equipment and activities include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers). Construction of large structural elements and mechanical systems could require the use of a crane for placement and assembly tasks, which may also generate noise levels. Although a detailed construction equipment list is not currently available, based on this project type it is expected that the primary sources of noise would include backhoes, bulldozers, and excavators. Noise emission levels from typical types of construction equipment can range from approximately 74 to 94 dBA at 50 feet.

Based on this information and accounting for typical usage factors of individual pieces of equipment and activity types, on-site construction could result in hourly average noise levels of 87 dBA L_{eq} at 50 feet and maximum noise levels of 90 dBA L_{max} at 50 feet from the simultaneous operation of heavy-duty equipment and blasting activities, if deemed necessary. Based on these and general attenuation rates, exterior noise levels at noise-sensitive receptors located within thousands of feet from project sites could exceed typical standards (e.g., 50/60 dBA L_{eq}/L_{max} during the daytime hours and 40/50 dBA L_{eq}/L_{max} during the nighttime hours).

Additionally, construction activities may result in varying degrees of temporary groundborne noise and vibration, depending on the specific construction equipment used and activities involved. Groundborne noise and vibration levels caused by various types of construction equipment and activities (e.g., bulldozers, blasting) range from 58 – 109 VdB and from 0.003 – 0.089 in/sec PPV at 25 feet. Similar to the above discussion, although a detailed construction equipment list is not currently available, based on this project type it is expected that the primary sources of groundborne vibration and noise would include bulldozers and trucks. According to FTA, levels associated with the use of a large bulldozer and trucks are 0.089 and 0.076 in/sec PPV (87 and 86 VdB) at 25 feet, respectively. With respect to the prevention of structural damage, construction-related activities would not exceed recommended levels (e.g., 0.2 in/sec PPV). However, based on FTA's recommended procedure for applying a propagation adjustment to these reference levels, bulldozing and truck activities could exceed recommended levels with respect to the prevention of human disturbance (e.g., 80 VdB) within 275 feet.

Thus, implementation of reasonably foreseeable compliance responses 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.

Short-term construction-related impacts on noise associated with the Energy Sector could be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.a

The Regulatory Setting in Attachment 2 includes, but is not limited to, applicable laws and regulations that pertain to noise. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that could be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a "project" under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize noise include:

- Proponents of new or modified facilities constructed under the reasonably foreseeable compliance responses would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts of the project. The definition of actions required to mitigate potentially significant noise impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
- Ensure noise-generating construction activities (including truck deliveries, pile driving and blasting) are limited to the least noise-sensitive times of day (e.g., weekdays during the daytime hours) for projects near sensitive receptors.
- Consider use of noise barriers, such as berms, to limit ambient noise at property lines, especially where sensitive receptors may be present.
- Ensure all project equipment has sound-control devices no less effective than those provided on the original equipment.
- All construction equipment used would be adequately muffled and maintained.
- Consider use of battery powered forklifts and other facility vehicles.

- Ensure all stationary construction equipment (i.e., compressors and generators) is located as far as practicable from nearby sensitive receptors or shielded.
- Properly maintain mufflers, brakes and all loose items on construction- and operation-related-related vehicles to minimize noise and address operational safety issues. Keep truck operations to the quietest operating speeds. Advise about downshifting and vehicle operations in sensitive communities to keep truck noise to a minimum.
- Use noise controls on standard construction equipment; shield impact tools.
- Consider use of flashing lights instead of audible back-up alarms on mobile equipment.
- Install mufflers on air coolers and exhaust stacks of all diesel and gas-driven engines.
- Equip all emergency pressure relief valves and steam blow-down lines with silencers to limit noise levels.
- Contain facilities within buildings or other types of effective noise enclosures.
- Employ engineering controls, including sound-insulated equipment and control rooms, to reduce the average noise level in normal work areas.

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding noise resulting from the construction of new facilities or reconstruction of existing facilities associated with the Energy Sector could be **potentially significant and unavoidable**.

Long-Term Operational Impact

Compliance responses associated with the Energy Sector could include: ZNE design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns), and construction of new energy storage facilities, and small modifications to oil and gas pipelines (e.g., valves). Development of these projects would likely occur within footprints of existing facilities,

and within areas with zoning that would permit the development of manufacturing or industrial uses, or public lands where the appropriate State or federal agency has determined that such uses are allowable. Development projects within manufacturing or industrial use areas are not anticipated to expose receptors to substantially increased operational noise levels.

However, though generally sited in rural areas, wind turbine farms, when in motion, emit a perceptible sound. This sound is generated from the wind turbine at points near the hub or nacelle, from the blade tips as they rotate, and transformers near ground level. The level of operational noise varies with the speed of the turbine blades, meteorological conditions, terrain, and the distance of the listener from the turbine. Due to technological advancements (e.g., upwind versus downwind rotor placement, low-noise gearboxes, insulated nacelles, pitch-control rotors, vibration-isolated mechanical equipment, and variable speed operation), typical noise level of wind turbines have decreased. These technologies have helped to alter noise to be more broadband in nature, rather than whines, whirrs, buzzes, hums, and thumping, which are the types of noises commonly associated with noise-related concerns.

Recent studies associated with wind turbines have been related to infrasound effects. Infrasound is sound that is lower in frequencies than the normal limit of human hearing (20 hertz). According to the Chief Medical Officer of Health of Ontario, there is no compelling evidence that infrasound adversely effects humans. The report states that low-frequency sounds and infrasounds are extremely common in the environment, and are emitted from various sources, including wind, rivers, road traffic, aircraft, and ventilation systems. In addition, the study find that while some people living near wind turbines report symptoms such as dizziness, headaches, and sleep disturbances, there are not direct causal links between the wind turbine noise and adverse health effects (Chief Medical Officer of Health of Ontario 2012).

Regardless of these results, people may find the sound of wind turbines to be annoying. To determine the potential noise impacts at nearby residences from wind turbine operations, sound level data would need to be assessed on a project-by-project basis. Whether the turbine noise is intrusive would depend on various siting factors, in additional to background noise, which varies with the level of human and animal activities, as well as meteorological conditions (e.g., wind speed). However, the potential to affect people remains unknown, and siting locations and other requirements are under individual county jurisdiction (with the exception of requirements under Cal. Gov. Code, tit. 7, § 68593 et. seq.).

Long-term operational impacts on noise associated with the Energy Sector could be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.a (2)

The Regulatory Setting in Attachment 2 includes, but is not limited to, applicable laws and regulations that pertain to noise. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that could be approved by local jurisdictions or State agencies. The ability to require such measures is under the purview of jurisdictions or State agencies with land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. The following mitigation measures are recommended to reduce potential noise impacts.

The proponents for a proposed wind turbine farm project will prepare a noise study to assess the operational effects of proposed wind turbines on nearby receptors. This study should consider local noise ordinances, and determine methods to comply with these ordinances in the case that levels could be exceeded. Mitigation options that may be considered include: revising turbine layout, nighttime curtailment of select turbines, utilizing an alternate turbine manufacturer, and implementation of noise reduction technology (e.g., installation of adaptive control to control rotation speed and blade pitch, night-time shutdowns).

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 analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant long-term operational impact on noise associated with the recommended actions in the Energy Sector could be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 13.b

Short-Term Construction-Related Impacts

There are four major types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an

increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of construction-related impacts on noise would be of similar type and magnitude as those discussed under Impact 13.a under the Energy Sector.

Short-term construction-related impacts on noise associated with the Transportation Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.b: Implement Mitigation Measure 13.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding noise resulting from the construction of new facilities or modification of existing facilities associated with the Transportation Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impact

The recommended actions associated with the Transportation Sector could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrids, plug-in hybrid electric, battery electric vehicles, and fuel cell vehicles, could require development of new and/or modified manufacturing plants. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location of any new facilities or modification of existing facilities.

However, development projects would likely occur within footprints of existing facilities, areas with zoning that would permit the development of manufacturing or industrial uses, or public lands where the appropriate State or federal agency has determined that such uses are allowable. Thus, implementation of any new regulations would not be anticipated to result in modifications near existing public (or public use) airports or private airstrips. No substantial increases in noises are anticipated.

Long-term operational noise impacts associated with the Transportation Sector would be **less than significant**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 13.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial conversion of agriculture or forest lands. Furthermore, modifications would occur in rural areas, not in close proximity to sensitive receptor. Potential modifications to existing facilities are not anticipated to substantially increase noise levels.

Thus, short-term construction-related and long-term operational noise impacts under the Agriculture Sector would be **less than significant**.

d) Water Sector

Impact 13.d

Short-Term Construction-Related Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance,

and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities. The types of construction-related impacts on noise would be of similar type and magnitude as those discussed under Impact 13.a for the Energy Sector.

The types of construction-related impacts, associated with the Water Sector, on noise would be of similar type and magnitude as those discussed under Impact 13.a under the Energy Sector.

Short-term construction-related impacts on noise would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.d: Implement Mitigation Measure 13.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding noise resulting from the construction of new facilities or modification of existing facilities associated with the Water Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impact

Reasonably foreseeable compliance responses associated with the Water Sector include increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water

and wastewater plants could occur. Development projects would likely occur within footprints of existing facilities, areas with zoning that would permit the development of manufacturing or industrial uses, or public lands where the appropriate State or federal agency has determined that such uses are allowable. Thus, implementation of any new regulations would not be anticipated to result in modifications near existing public (or public use) airports or private airstrips. No substantial increases in noises are anticipated.

Long-term operational noise impacts associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 13.e

Short-Term Construction-Related Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

The types of construction-related impacts on noise would be of similar type and magnitude as those discussed under Impact 13.a under the Energy Sector.

Short-term construction-related impacts on noise would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.e: Implement Mitigation Measure 13.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding noise resulting from the construction of new facilities or modification of existing facilities associated with the Waste Management Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impact

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

Development projects would likely occur within footprints of existing facilities, areas with zoning that would permit the development of manufacturing or industrial uses, or public lands where the appropriate State or federal agency has determined that such uses are allowable. Thus, implementation of any new regulations would not be anticipated to result in modifications near existing public (or public use) airports or private airstrips. No substantial increases in noises are anticipated.

Long-term operational noise impacts associated with the Waste Management Sector would be **less than significant**.

f) Natural and Working Lands Sector

Impact 13.f

Short-Term Construction-Related and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown. Even though they would likely be sited in locations of appropriate zoning, new facilities associated with this sector (e.g., biomass) could have exterior noise sources associated with

operations (e.g., heavy duty equipment for biomass transfer and conveyors) which in some cases could be elevated, making it less likely the other structures would break the line-of-sight between the sources and receptors.

The types of construction-related impacts on noise would be of similar type and magnitude as those discussed under Impact 13.a under the Energy Sector.

Short-term construction-related and long-term operational effects on noise associated with the Natural and Working Land Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.f: Implement Mitigation Measure 13.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related and long-term operational impacts regarding noise resulting from the construction of new facilities or modification of existing facilities associated with the Natural and Working Lands Sector would be **potentially significant and unavoidable**.

g) Short-Lived Climate Pollutants Sector

Impact 13.g

Short-Term Construction-Related Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of construction-related impacts on noise would be of similar type and magnitude as those discussed under Impact 13.a under the Energy Sector.

Short-term construction-related impacts on noise associated with the Short-Lived Climate Pollutants Sector would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.g: Implement Mitigation Measure 13.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding noise resulting from the construction of new facilities or modification of existing facilities associated with the Short-Lived Climate Pollutants Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impact

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them. Development projects would likely occur within footprints of existing facilities, areas with zoning that would permit the development of manufacturing or industrial uses, or public lands where the appropriate State or federal agency has determined that such uses are allowable. Thus, implementation of any new regulations would not be anticipated to result in modifications near existing public (or public use) airports or private airstrips. No significant long-term operational impacts are anticipated.

Long-term operational noise impacts associated with the Short-Lived Climate Pollutant Sector would be **less than significant**.

h) Green Buildings

Impact 13.h

Short-Term Construction-Related Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be

accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar, wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

The types of construction-related impacts on noise would be of similar type and magnitude as those discussed under Impact 13.a under the Energy Sector.

Short-term construction-related impacts on noise associated with Green Buildings would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 13.h: Implement Mitigation Measure 13.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant short-term construction-related impact regarding noise resulting from the construction of new facilities or modification of existing facilities associated with Green Buildings would be **potentially significant and unavoidable**.

Long-Term Operational Impact

Compliance responses associated with Green Buildings would consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar PV, wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

Development projects would likely occur within footprints of existing facilities, areas with zoning that would permit the development of manufacturing or industrial uses, or public lands where the appropriate State or federal agency has determined that such uses are allowable. Thus, implementation of any new regulations would not be anticipated to result in modifications near existing public (or public use) airports or private airstrips.

For the reasons described above under Impact 13.a, development of wind turbine farms could result in long-term operational noise impacts.

Long-term operational noise impacts associated with Green Buildings would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure: Implement Mitigation Measure 13.a

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 analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant long-term operational impact on noise associated with the recommended actions in the Energy Sector could be **potentially significant and unavoidable**.

i) Cap-and-Trade Regulation

Impact 13.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses that consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes involve construction which has the potential to introduce short-term noise levels that would exceed acceptable ambient levels. Because of the short-term nature of construction, and the industrial setting in which these noises would occur, this impact

would be less than significant. Recognized measures exist that are implemented as standard practice to minimize construction noise.

Implementation of projects under the ODS Offset Protocol would not result in significant adverse noise impacts and is identified as less than significant. Implementation of projects under the Livestock Offset Protocol would allow the construction of digesters in agricultural settings. Construction of digesters could adversely impact sensitive receptors and is considered a significant and unavoidable impact. The FED recognized measures that exist to reduce this potential impact, but the authority to require project-specific mitigation lies with local permitting agencies and not ARB. Consequently, this impact is identified as significant and unavoidable. Projects implemented under the Urban Forest Offset Protocol would not produce unacceptable noise levels and is considered a less than significant impact. Projects implemented under the Forest Offset Protocol would occur in forested areas. Forest projects would produce elevated noise levels that exceed accepted ambient levels. However, adoption of the Forest Offset Protocol would not alter the extent of forest activities, but would simply shift some activities to projects that sequester carbon. Because the level of overall forest activities would not change, the consequential noise impacts would not change. Thus, this impact is considered less than significant.

Impacts related to CCS are described above under the Energy Sector.

14. Population and Housing

a) Energy Sector

Impact 14.a

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

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, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available.

Operation of these new facilities would not be expected require new additional housing or generate changes in land use that would conflict with adopted plans.

Therefore, short-term construction- and long-term operational impacts on population growth, and displacement of housing or people associated with the Energy Sector would be **less than significant**.

b) Transportation Sector

Impact 14.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing 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, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Operation of these new facilities would not be expected require new additional housing or generate changes in land use that would conflict with adopted plans.

Therefore, short-term construction- and long-term operational impacts on population growth, and displacement of housing or people associated with the Transportation Sector would be **less than significant**.

c) Agriculture Sector

Impact 14.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest

lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. 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, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Operation of these new facilities would not be expected require additional new housing or generate changes in land use that would conflict with adopted plans.

Therefore, short-term construction- and long-term operational impacts under the Agriculture Sector associated with population growth, and displacement of housing or people would be **less than significant**.

d) Water Sector

Impact 14.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur.

The types of construction-related and long-term operational impacts on population and housing would be of similar type and magnitude as those discussed under Impact 14.a for the Energy Sector.

Therefore, short-term construction-related and long-term operational impacts on population growth, and displacement of housing or people associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 14.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

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, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Operation of these new facilities would not be expected require additional new housing or generate changes in land use that would conflict with adopted plans.

Therefore, short-term construction- and long-term operational impacts on population growth, and displacement of housing or people associated with the Waste Management Sector would be **less than significant**.

f) Natural and Working Lands Sector

Impact 14.f

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands.

Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

Individual projects would be anticipated to require relatively small crews, and demand for these crews would be temporary (e.g., 6 – 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. Operation of new facilities would not be expected require additional new housing or generate changes in land use that would conflict with adopted plans.

Therefore, short-term construction- and long-term operational impacts on population growth, and displacement of housing or people associated with the Natural and Working Lands Sector would be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 14.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

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, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Operation of new facilities would not be expected require additional new housing or generate changes in land use that would conflict with adopted plans.

Therefore, short-term construction- and long-term operational impacts on population growth, and displacement of housing or people associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

h) Green Buildings

Impact 14.h

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms.

These building components could be incorporated into new structures or added as part of building remodeling projects.

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, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Operation of new facilities would not be expected require additional new housing or generate changes in land use that would conflict with adopted plans.

Therefore, short-term construction-related and long-term operational impacts on population growth, and displacement of housing or people associated with Green Buildings would be **less than significant**.

i) Cap-and-Trade Regulation

Impact 14.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The Cap-and-Trade Regulation, including implementation of offset projects under the compliance offset protocols would not result in significant adverse impacts to employment, population, or housing. All impacts to population, employment, and housing would be less than significant.

Impacts related to CCS are described above under the Energy Sector.

15. Public Services

a) Energy Sector

Impact 15.a

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy

projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. 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 and operational 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.

As a result, short-term construction-related and long-term operational impacts, associated with the Energy Sector, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

b) Transportation Sector

Impact 15.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities. However, these would likely occur within footprints of existing facilities,

or in areas with zoning that would permit the development of manufacturing or industrial uses. 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 and operational 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.

As a result, short-term construction- and long-term operational impacts, associated with the Transportation Sector, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 15.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial conversion of agriculture or forest lands. In addition, implementation of recommendations associated with the Agriculture Sector would not be expected to increase population levels, such that public services are affected.

As a result, short-term construction-related and long-term operational impacts, associated with the Agriculture Sector, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

d) Water Sector

Impact 15.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within

State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. 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 and operational 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.

As a result, short-term construction-related and long-term operational impacts, associated with the Water Sector, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

e) Waste Management Sector

Impact 15.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. 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 and operational 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.

As a result, short-term construction-related and long-term impacts, associated with the Waste Management Sector, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

f) Natural and Working Lands Sector

Impact 15.f

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations of appropriate zoning. These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. 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 and operational 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.

As a result, short-term construction-related and long-term impacts, associated with the Natural and Working Lands Sector, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 15.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. 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 and operational 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.

As a result, short-term construction- and long-term impacts, associated with the Short-Lived Climate Pollutants Sector, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

h) Green Buildings

Impact 15.h

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. 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.

As a result, short-term construction-related and long-term operational impacts, associated with Green Buildings, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

i) Cap-and-Trade Regulation

Impact 15.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. These projects would not increase the level of public services beyond that already provided to existing facilities and is considered a less-than-significant impact. Implementation of projects under the ODS Offset Protocol, the Livestock Offset Protocol, and the Urban Forest Protocol would not result in a need for an increased level of public services beyond that already provided to existing facilities. Implementation of projects under the Forest Offset Protocol would not alter the extent of forest activities, but would shift some activities to projects that sequester carbon. Because the level of overall forest activities would not change, the consequential need for public services would not change. Thus, this impact of all the offset protocols is considered less than significant.

Impacts related to CCS are described above under the Energy Sector.

16. Recreation

a) Energy Sector

Impact 16.a

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

These activities would likely occur within footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. In addition, demand for these crews would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational impacts on regional parks or other recreational facilities associated with the Energy Sector would be **less than significant**.

b) Transportation Sector

Impact 16.b

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions

and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations.

These activities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning. In addition, demand for these crews would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational impacts on regional parks or other recreational facilities associated with the Transportation Sector would be **less than significant**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 16.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms.

These activities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning. In addition, demand for these crews would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially

deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational impacts on regional parks or other recreational facilities associated with the Agricultural Sector would be **less than significant**.

d) Water Sector

Impact 16.d

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

These activities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning. In addition, demand for these crews would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially

deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational effects on regional parks or other recreational facilities, associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 16.e

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

These activities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning. In addition, demand for these crews would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational effects on regional parks or other recreational facilities associated with the Waste Management Sector would be **less than significant**.

f) Natural and Working Lands Sector

Impact 16.f

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also

involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs. These actions are not anticipated to affect recreational facilities.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities).

While potential locations for these facilities are currently unknown, these activities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning. In addition, demand for these crews would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational impacts on regional parks or other recreational facilities associated with the Natural and Working Lands Sector would be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 16.g

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

Demand for construction crews to build these facilities would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional

population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational impacts on regional parks or other recreational facilities, associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

h) Green Building Sector

Impact 16.h

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

These activities would likely occur within footprints of existing facilities, or in areas with appropriate zoning. In addition, demand for these crews would be temporary (e.g., 6 – 12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreational-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational impacts on regional parks or other recreational facilities would be **less than significant**.

i) Cap-and-Trade Regulation

Impact 16.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. These actions would have a less than significant impact on recreation resources.

Implementation of projects under the ODS Offset Protocol, the Livestock Offset Protocol, the Urban Forest Offset Protocol would result in a less than significant impact on recreation resources. Implementation of projects under Forest Offset Protocol would involve forest management activities that could disrupt opportunities for forest recreation, but such disruptions exist under current conditions. Offset projects developed under the Forest Offset Protocol would include the construction of roads, temporary closures for tree installation and periodic increases in truck or construction equipment traffic that could disrupt recreational activities, but these forest projects developed under the Forest Offset Protocol would occur on land that was historically forested or currently forested, and consequently, the overall impact to recreational resources would be less than significant.

Impacts related to CCS are described above under the Energy Sector.

17. Transportation and Traffic

a) Energy Sector

Impact 17.a

Short-Term Construction-Related Impacts

Implementation of recommended actions under the Energy Sector could result in projects ranging from increased maintenance activities to large-scale renewable energy projects. Compliance responses could include: zero-net-energy design standards for homes and business, demand-response programs, distributed renewable energy

generation, CHP systems, CCS facilities, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground caverns) or construction of new energy storage facilities, installation of new pipelines and other subterranean components, and small modifications to oil and gas pipelines (e.g., valves).

Although detailed information about potential specific construction activities is not currently available, it would be anticipated to 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 Energy Sector would be potentially significant.

This impact on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB and not within its purview.

Mitigation Measure 17.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations in regards to transportation. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize construction traffic impacts include:

- Proponents of new or modified facilities constructed would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements

(e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.

- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen potentially significant impacts on traffic and transportation. The definition of actions required to mitigate potentially significant traffic impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
    - Minimize the number and length of access, internal, service and maintenance roads and use existing roads when feasible.
    - Provide for safe ingress and egress to/from the proposed project site. Identify road design requirements for any proposed roads, and related road improvements.
    - If new roads are necessary, prepare a road siting plan and consult standards contained in federal, State, or local requirements. The plans should include design and construction protocols to meet the appropriate roadway standards and be no larger than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Access roads should be located to avoid or minimize impacts to washes and stream crossings, follow natural contours and minimize side-hill cuts. Roads internal to a project site should be designed to minimize ground disturbance. Excessive grades on roads, road embankments, ditches, and drainages should be avoided, especially in areas with erodible soils.
    - Prepare a Construction Traffic Control Plan and a Traffic Management Plan.

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact regarding traffic resulting from the construction of new facilities or modification of existing facilities associated with the Energy Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the reasonably foreseeable compliance responses associated with the Energy Sector would not result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

Long-term operational impacts to transportation and traffic associated with the Energy Sector would be **less than significant**.

b) Transportation Sector

Impact 17.b

Short-Term Construction-Related Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems. These recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts associated with construction impacts on performance of circulation systems; congestion management programs, air traffic patterns; hazards; emergency access, policies, plans, and programs would be of similar type and magnitude as those discussed under Impact 17.a. above. This impact would be potentially significant.

This impact on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 17.b: Implement Mitigation Measure 17.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact regarding traffic resulting from the construction of new facilities or modification of existing facilities associated with the Transportation Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the reasonably foreseeable compliance responses associated with the Transportation Sector would not result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

Long-term operational impacts to transportation and traffic associated with the Energy Sector would be **less than significant**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 17.c

Short-Term Construction-Related Impacts and Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial conversion of agriculture or forest lands. Therefore, the recommended actions in the Agriculture Sector would result in **less-than-significant** construction-related and operational impacts.

d) Water Sector

Impact 17.d

Short-Term Construction-Related Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of construction-related impacts on transportation and traffic would be of similar type and magnitude as those discussed under Impact 16.a for the Energy Sector.

Transportation and traffic impacts during construction projects associated with the Water Sector would be potentially significant.

This impact on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 17.d: Implement Mitigation Measure 17.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact regarding traffic resulting from the construction of new facilities or modification of existing facilities associated with the Water Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the reasonably foreseeable compliance responses associated with the Water Sector would not result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

Long-term operational impacts to transportation and traffic associated with the Water Sector would be **less than significant**.

e) Waste Management Sector

Impact 17.e

Short-Term Construction-Related Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills.

The types of impacts associated with construction impacts on performance of circulation systems; congestion management programs, air traffic patterns; hazards; emergency access, policies, plans, and programs would be of similar type and magnitude as those discussed under Impact 17.a, above.

Transportation and traffic impacts during construction projects associated with the Waste Management Sector would be potentially significant.

This impact on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 17.e: Implement Mitigation Measure 17.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact regarding traffic resulting from the construction of new facilities or modification of existing facilities associated with the Waste Management Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the reasonably foreseeable compliance responses associated with the Waste Management Sector would not result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

Long-term operational impacts to transportation and traffic associated with the Waste Management Sector would be **less than significant**.

f) Natural and Working Lands Sector

Impact 17.f

Short-Term Construction-Related Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory. In addition, planning efforts within and across jurisdictions would aim to create interconnected land areas and ecosystems throughout urban, natural and working lands, and agricultural croplands. Compliance responses associated with the Natural and Working Land Sector could also involve coordination with state agencies including: CNRA, CalEPA, OPR, CDFA, CalFire, BOF, CDFW, and ARB to develop land use programs. These programs would generally be designed to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, efforts could be made to increase the use of green infrastructure. Green infrastructure uses vegetation and soils to manage stormwater runoff, with technology such as rainwater harvesting, bioswales, permeable pavement, and green (i.e., growing media and vegetation) roofs.

In addition to land use planning efforts, incentives could be created to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels. In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations of appropriate zoning.

The types of impacts associated with construction impacts on performance of circulation systems; congestion management programs, air traffic patterns; hazards; emergency access, policies, plans, and programs would be of similar type and magnitude as those discussed under Impact 17.a, above.

Transportation and traffic impacts during construction projects associated with the Natural and Working Lands Sector would be potentially significant.

This impact on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 17.f: Implement Mitigation Measure 17.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is

inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact regarding traffic resulting from the construction of new facilities or modification of existing facilities associated with the Natural and Working Lands Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the reasonably foreseeable compliance responses associated with the Natural and Working Lands Sector would not result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

Long-term operational impacts to transportation and traffic associated with the Natural and Working Lands Sector would be **less than significant**.

g) Short-Lived Climate Pollutants Sector

Impact 17.g

Short-Term Construction-Related Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of impacts associated with construction impacts on performance of circulation systems; congestion management programs, air traffic patterns; hazards; emergency access, policies, plans, and programs would be of similar type and magnitude as those discussed under Impact 17.a, above.

Transportation and traffic impacts during construction projects associated with the Short-Lived Climate Pollutants Sector would be potentially significant. Implementation of the reasonably foreseeable compliance responses under this measure would not, however, result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

This impact on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 17.g: Implement Mitigation Measure 17.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact regarding traffic resulting from the construction of new facilities or modification of existing facilities associated with the Short-Lived Climate Pollutant Sector would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the reasonably foreseeable compliance responses associated with the Short-Lived Climate Pollutants Sector would not result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

Long-term operational impacts to transportation and traffic associated with the Short-Lived Climate Pollutants Sector would be **less than significant**.

h) Green Buildings

Impact 17.h

Short-Term Construction-Related Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings could consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects.

New construction activities, including buildings, and renewable energy supply installations could be placed on land that is currently used for agricultural purposes. The types of impacts associated with construction impacts on performance of circulation systems; congestion management programs, air traffic patterns; hazards; emergency

access, policies, plans, and programs would be of similar type and magnitude as those discussed under Impact 17.a, above.

Transportation and traffic impacts during construction projects associated with Green Buildings would be potentially significant.

This impact on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 17.h: Implement Mitigation Measure 17.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact regarding traffic resulting from the construction of new facilities or modification of existing facilities associated with Green Buildings would be **potentially significant and unavoidable**.

Long-Term Operational Impacts

Implementation of the reasonably foreseeable compliance responses associated with Green Buildings would not result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

Long-term operational impacts to transportation and traffic associated with Green Buildings would be **less than significant**.

i) Cap-and-Trade Regulation

Impact 17.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations

and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

Implementation of covered entity compliance responses is not expected to result in significant adverse impacts to transportation or traffic. If a facility expands or requires construction to take place, increases in construction traffic would be temporary and considered less than significant. Construction traffic impacts can be mitigated through ingress and egress controls, traffic controls, and reduced speed zones to address safety.

Activities undertaken to develop offset projects would be expected to vary according to the type of offset project. Transportation and traffic impacts resulting from the implementation of projects under the ODS Protocol, Urban Forest Protocol, and Forest Offset Protocol are considered to be less than significant. Construction of livestock digesters under the Livestock Offset Protocol could require the operation of heavy equipment on rural roads, potentially creating unsafe conditions. The FED identified recognized measures that exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the FED took the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that this impact may be potentially significant and unavoidable.

Impacts related to CCS are described above under the Energy Sector.

18. Utilities and Service Systems

Utilities and Service Systems impacts are inherently long-term and related to the operational facilities; thus, short-term construction-related impacts are not discussed below.

a) Energy Sector

Impact 18.a

Long-Term Operational Impacts

Compliance responses could include: zero-net-energy design for homes and business, demand-response programs, distributed renewable energy generation, CHP systems, energy storage technologies, smart grid and microgrid systems, and upgrades to oil and gas production, processing, storage, distribution, and transmission systems. Construction projects associated with these compliance responses could include various facilities, such as solar PV and wind turbine farms, new CHP facilities or retrofits of existing CHP facilities, modification to existing structures (e.g., dams, underground

caverns) or construction of new energy storage facilities, and small modifications to oil and gas pipelines (e.g., valves).

Because heavy cloud cover and too high/low winds cannot be predicted with a high level of certainty, wind and solar power must be fully backed up with peaking power supply capacity such as natural gas. Similar to adjusting and balancing power grid's supply-demand when 'on-demand' customers significantly change their power usage (without notification or constraints), the loss or gain of wind and solar power must be similarly controlled by adjusting peaking power generation capacities. Thus, while renewable energy sources could reduce some demand from power plants, without viable energy storage systems, additional, long-term backup power sources would be required to provide energy to homes and business that use renewable energy supplies. For the purposes of this analysis, it can be assumed that back up energy supplies would be incorporated into proposed projects, and would be subject to individual CEQA review, ensuring that adequate electricity loads would be available to serve the project.

However, 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. In addition, 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 State 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. Through the environmental review process, utility and service demands would be calculated, agencies would provide input on available service capacity and the potential need for service-related infrastructure including expansions to waste water treatment plants, new water supply entitlements and infrastructure, storm water infrastructure, and solid waste handling capacity (e.g., landfills). Resulting environmental impacts would also be determined through this process.

At this time, 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 ARB 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 for which it is unknown whether mitigation would be available to reduce the impacts. Thus, long-term operational impacts on utilities and service systems associated with the Energy Sector would be potentially significant.

This impact on utilities and service systems could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 18.a

The Regulatory Setting in Attachment 2 includes applicable laws and regulations that relate to utilities and service systems. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a "project" under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize utility and service-related impacts include:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance responses would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen potentially significant impacts on utilities and service systems. The definition of actions required to mitigate potentially significant utility or service-related impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
    - Comply with local plans and policies regarding the provision of water supply, wastewater treatment, and storm water drainage utilities, and solid waste services.
    - Where an on-site wastewater system is proposed, submit a permit application to the appropriate local jurisdiction.
    - Where appropriate, prepare a Water Supply Assessment (WSA) consistent with the requirements of Section 21151.9 of the Public Resources Code/ Section 10910 et seq. of the Water Code. The WSA would be approved by the local water agency/purveyor prior to construction of the project.
    - Comply with local plans and policies regarding the provision of wastewater treatment services.

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially impact to utilities and service systems resulting from the operation of new facilities associated with the Energy Sector would be **potentially significant and unavoidable**.

b) Transportation Sector

Impact 18.b

Long-Term Operational Impacts

There are four types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and implement communities to reduce vehicular GHG emissions and provide more transportation options; and, (4) improve the efficiency and throughput of existing transportation systems.

Reasonably foreseeable compliance responses associated with the Transportation Sector could include infrastructure to support clean vehicles may be required, such as charging infrastructure. This type of infrastructure could result in increased demand for electricity and increase load in specific locations. Any new charging facilities are likely to be located within close proximity to existing electrical infrastructure (e.g., within parking lots and residences). New or modified utility installation, connections, and expansion would be subject to the requirements of the applicable utility providers.

The charging of BEVs and ZEVs has the potential for both positive and negative effects to the electric grid. The timing of charging is a key determining factor. For residential charging, the general case is that the EV changing will typically begin after drivers arrive home. National Personal Transportation Survey data indicate that the peak arrive time is 5-6 p.m.; however, only about 12 percent of vehicles arrive home during this hour, leading to a distribution of charging onset times. This results in an effective peak charging load of about 700 watts per vehicle. Thus, while residential charging power levels vary from about 1.4 to 7.7 kW, the average effect of a single vehicle on the electric system is far lower. There are significant efforts underway to alter the load shape generated by vehicle charging, whether by use of electricity pricing incentives, actively managed or smart charging, or onboard programming of charging times. These would have the effect of moving the load off the peak. At a system level, due to diversity, the electricity demand of these types of vehicles is relatively low, resulting in

minimal effects to utility generation and transmission assets, particularly in the near term. According to the Electric Power Research Institute, the potential stresses on the electric grid can be avoided through asset management, system design practices, and managed charging to shift a significant amount of the load away from system peak (Electric Power Research Institute 2011).

However, recommended actions could result in an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or zero-emission technologies. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, could require development of new and/or modified manufacturing plants. In addition, fixed-guideway systems to transport shipment containers may be installed at marine ports and near dock railyards. Infrastructure to support clean vehicles may be required, such as charging infrastructure and alternative fueling stations. Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities.

The types of impacts related to water supply, wastewater treatment, and stormwater, and solid waste infrastructure associated with operation of new facilities would be of similar type and magnitude as those discussed under Impact 18.a, associated with the Energy Sector.

Thus, long-term operational impacts on utilities and services systems, associated with the Transportation Sector would be potentially significant.

This impact on utilities and service systems could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 18.b: Implement Mitigation Measure 18.a

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 that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact to utilities and service systems resulting from the operation of new facilities associated with the Transportation Sector would be **potentially significant and unavoidable**.

Impacts related to CCS are described above under the Energy Sector.

c) Agriculture Sector

Impact 18.c

Long-Term Operational Impacts

Compliance responses associated with the Agriculture Sector would incentivize onsite management practices, and increase conservation efforts for agricultural and forest lands. Addressing regulatory limitations associated with the use of digester biogas used in natural gas pipelines and bioenergy used to supply the electricity grid could result in the installation of new equipment within existing farms. However, these would likely constitute minor modifications to existing facilities, and not result in substantial increased demand for water supply, wastewater treatment, stormwater, or solid waste infrastructure. In addition, additional utility capacity would not be expected under these recommended actions.

Thus, long-term operational impacts on utilities and service systems associated with the Agriculture Sector would be **less than significant**.

d) Water Sector

Impact 18.d

Long-Term Operational Impacts

The Proposed Update includes three types of recommended actions to reduce water-related energy use and associated GHG emissions in the Water Sector: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less energy-intensive water management, such as a comprehensive groundwater policy. Rates could be adjusted through financial and regulatory incentives to promote widespread adoption of strong and equitable price signals to maximize conservation. These incentives could be made available within State grants and loans, or through applicable regulatory relief processes, such as water rights applications.

Reasonably foreseeable compliance responses associated with the recommended actions in the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur. Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to

the exact location or character of any new facilities or modification of existing facilities. Compliance responses associated with the Water Sector primarily relate to the development of policies, guidance, and funding plans. These plans would generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. Projects could include rate adjustments, investments in conservation, and water management policies.

The types of long-term operational impacts on utilities and service systems would be of similar type and magnitude as those discussed under Impact 18.a for the Energy Sector.

Thus, long-term operational impacts on utilities and service systems associated with the Water Sector would be potentially significant.

This impact on utilities and service systems could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 18.d: Implement Mitigation Measure 18.a

Because the authority to determine project-level impacts and require project-level mitigation lies with the local or State land use and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact to utilities and service systems resulting from the operation of new facilities associated with the Water Sector would be **potentially significant and unavoidable**.

e) Waste Management Sector

Impact 18.e

Long-Term Operational Impacts

Implementation of the Waste Management recommendations in the Proposed Update could require construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling and anaerobic digestion facilities. In addition, existing and new facilities could result in installation of new CH_4 control devices at landfills. The recommended actions under the Waste Management Sector would generally reduce the rate at which landfills reach capacity, which may provide benefits to some facilities.

The types of impacts related to water supply, wastewater treatment, and stormwater infrastructure associated with new facilities would be of similar type and magnitude as those discussed under Impact 18.a, associated with the Energy Sector.

Thus, long-term operational impacts on utilities and service systems associated with the Waste Management Sector would be potentially significant.

This impact on utilities and service systems could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 18.e: Implement Mitigation Measure 18.a

Because the authority to determine project-level impacts and require project-level mitigation lies with the local or State land use and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact to utilities and service systems resulting from the operation of new facilities associated with the Waste Management Sector would be **potentially significant and unavoidable**.

f) Natural and Working Lands Sector

Impact 18.f

Long-Term Operational Impacts

Recommended actions under the Proposed Update include addressing data gaps in California's inventory for natural and working lands, particularly with respect to carbon flux in rangelands and development of a wetlands inventory.

In addition, recommendations for the Natural and Working Lands Sector could cause an increase in the construction of facilities that would be used to convert urban, agricultural, and forest wastes into electricity and transportation fuels (e.g., biomass facilities). Furthermore, construction of new energy supply operations could require new energy transmission facilities and other infrastructure. The location and size of potential facilities is currently unknown; however, it is likely that they would be sited in locations of appropriate zoning.

The types of impacts related to water supply, wastewater treatment, and stormwater, and solid waste infrastructure associated with new facilities would be of similar type and magnitude as those discussed under Impact 18.a, associated with the Energy Sector.

Long-term operational impacts on utilities and service systems associated with the Natural and Working Lands Sector would be potentially significant.

This impact on utilities and service systems could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 18.f: Implement Mitigation Measure 18.a

Because the authority to determine project-level impacts and require project-level mitigation lies with the local or State land use and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact to utilities and service systems resulting from the operation of new facilities associated with the Natural and Working Lands Sector would be **potentially significant and unavoidable**.

g) Short-Lived Climate Pollutants Sector

Impact 18.g

Long-Term Operational Impacts

The recommended actions and associated compliance responses in the Short Lived Climate Pollutants Sector could result in increased demand for new low-GWP compounds, and ODS destruction could result in new facilities to meet these needs. The location and size of these potential facilities is unknown; however, it is likely that they would be sited in locations that were appropriately zoned to accommodate them.

The types of impacts related to water supply, wastewater treatment, and stormwater, and solid waste infrastructure associated with new facilities would be of similar type and magnitude as those discussed under Impact 18.a, associated with the Energy Sector.

Long-term operational construction-related impacts on utilities and service systems associated with the Short-Lived Climate Pollutants Sector would be potentially significant.

This impact on utilities and service systems could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 18.g: Implement Mitigation Measure 18.a

Because the authority to determine project-level impacts and require project-level mitigation lies with the local or State land use and/or permitting agency for individual

projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact to utilities and service systems resulting from the operation of new facilities associated with the Short-Lived Climate Pollutants would be **potentially significant and unavoidable**.

h) Green Buildings

Impact 18.h

Long-Term Operational Impacts

The Proposed Update includes actions for Green Buildings that include development of a comprehensive GHG emission reduction program for new construction, building retrofits, and operation and maintenance of certified green buildings. Compliance responses associated with Green Buildings would consist of new requirements that would likely result in an increase in ZNE and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms. These building components could be incorporated into new structures or added as part of building remodeling projects. In addition, utility-scale renewable energy projects may require additional infrastructure to distribute or generate energy supplies.

The types of impacts related to water supply, wastewater treatment, and stormwater, and solid waste infrastructure associated with new facilities would be of similar type and magnitude as those discussed under Impact 18.a, associated with the Energy Sector.

Long-term operational impacts on utilities and service systems associated with Green Buildings would be potentially significant.

This impact on utilities and service systems could be reduced to a less-than-significant level by mitigation that can and should be implemented by local or State lead agencies, but is beyond the authority of the ARB.

Mitigation Measure 18.h: Implement Mitigation Measure 18.a

Because the authority to determine project-level impacts and require project-level mitigation lies with the local or State land use and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could 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 the potentially significant impact to utilities and service systems resulting from the operation of new facilities associated with Green Buildings would be **potentially significant and unavoidable**.

i) Cap-and-Trade Regulation

Impact 18.i

The reasonably foreseeable compliance responses associated with a continued Cap-and-Trade Regulation would be the same as those actions described in the 2010 Cap-and-Trade FED. This includes continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. The impacts associated with implementation of offset projects under any additional compliance offset protocols would be analyzed and disclosed for public and Board consideration when the protocol is developed and proposed. For the continued implementation of the existing regulations and protocols, the environmental analysis in the 2010 Cap-and-Trade FED would apply to this component of the Proposed Update. Impacts described in the 2010 Cap-and-Trade FED are described as follows, and detailed in Attachment 3 of this EA.

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. These projects would not increase the level of utilities beyond that already provided to existing facilities. Fuel switching could require provision of new services. The availability and extension of utilities is subject to approval of the local utility provider, and thus mitigated to less than significant.

Implementation of projects under the ODS Offset Protocol, Livestock Offset Protocol, and Urban Forest Offset Protocol would not result in a demand for a significant increase in the level of utilities or service systems that may serve existing sites. Construction of new facilities could require the incidental extension of utilities and services. The availability and extension of utilities is subject to approval of the local utility provider, and thus mitigated to less than significant.

Implementation of projects under the Forest Offset Protocol would not alter the extent of forest activities, but could increase forest projects to sequester carbon. Because the level of overall forest activities would not change, the consequential need for utility service systems associated with those activities would not change. Thus, this impact is considered less than significant.

Impacts related to CCS are described above under the Energy Sector.

5.0 CUMULATIVE AND GROWTH-INDUCING IMPACTS

A. Introduction

Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed project when added to other past, present, and reasonably foreseeable future actions. (Cal. Code Regs., tit. 14, § 15355(b).) Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

Although the Air Resources Board (ARB) is exempt from the requirement to prepare environmental impact reports (EIRs), ARB followed the general guidance of the California Environmental Quality Act (CEQA) Guidelines for considering the cumulative impacts of implementation of the recommended actions included in the Proposed First Update to the Climate Change Scoping Plan First Update (Proposed Update). The CEQA Guidelines state that cumulative impacts should be addressed when the cumulative impacts are expected to be significant and when the project's incremental contribution to the impact is cumulatively considerable. (Cal. Code Regs., tit. 14, § 15130, subd. (a).) Section 15130 of the CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of impacts attributable to the project alone. Where a lead agency is examining a project with an incremental impact that is not "cumulatively considerable," a lead agency need not consider that impact significant, but must briefly describe its basis for concluding that the incremental impact is not cumulatively considerable.

Environmental impact reports (EIRs) must consider "other projects creating related impacts." (Cal. Code Regs., tit. 14, § 15130(a)(1).) CEQA Guidelines section 15355(b) requires an analysis of "other closely related past, present, and reasonably foreseeable probable future projects." However, due to the programmatic nature of this Environmental Analysis (EA), because of the statewide reach of the Proposed Update and the longer-term future horizon for the greenhouse gas (GHG) emission reduction achievements, the impact analysis for the resource topics in Chapter 4 is inherently cumulative in nature, rather than site or project specific as they pertain to reasonably foreseeable compliance responses to the recommended actions. As a result, the character of the impact conclusions in the resource-oriented sections of Chapter 4 are cumulative by considering the potential impacts of the full range of reasonably foreseeable compliance responses, along with expected background growth in California, as appropriate.

This section, therefore, summarizes the cumulative and growth-inducing impacts associated with the recommended actions in the Proposed Update for each resource topic evaluated in this EA.

B. Cumulative Impacts

1. Aesthetics

Implementation of the reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require construction and operational activities associated with new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. 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 a 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 Proposed Update could result in a considerable contribution to a cumulative aesthetics-related impact.

2. Agricultural and Forest Resources

Implementation of the reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could include construction and operational activities associated with new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. 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. Because ARB 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 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 Proposed Update could result in a considerable contribution to a cumulative impact to agricultural and forest resources.

3. Air Quality

Reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could result in an increase in criteria air pollutants (CAPs) and toxic air contaminants (TACs), as well as generate unpleasant odors that could affect sensitive receptors. These would be generated by the use of heavy-duty construction equipment on a short-term basis, as well as longer-term operational impacts associated with biomass, anaerobic digestion and composting facilities; and combustion of some higher biodiesel blends in certain diesel engines. Therefore, the Proposed Update could generate emission levels that conflict with applicable air quality plans, violate or contribute substantially to an existing or projected ambient air quality standard violation, result in a cumulatively considerable net increase in non-attainment areas, or expose sensitive receptors to substantial pollutant concentrations or odors. However, all projects, no matter their size or type would be required to seek local or State land use approvals prior to their implementation. Part of the land use entitlement process requires that each of these projects undergo environmental review consistent with California environmental review requirements (e.g., CEQA) and other applicable local requirements (e.g., local air district rules and regulations). This environmental review process would assess whether project implementation would result in short-term construction and long-term operational air quality impacts.

Implementation of mitigation measures could potentially reduce construction-related and long-term operational 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 this 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, this EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that construction-related and long-term operational air quality impacts resulting from the development of new facilities or modification of existing facilities could be potentially significant and unavoidable. Thus, the Proposed Update could result in a considerable contribution to a cumulative air quality impact.

4. Biological Resources

Implementation of reasonably foreseeable compliance responses could require construction and operational activities associated with new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. 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.

The biological resources that could be affected by construction and operation associated with implementation of new regulations and/or incentive measures, 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 Proposed Update could result in a considerable contribution to a cumulative impact on biological resources.

5. Cultural Resources

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require construction activities associated with new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. 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 ARB, any mitigation identified would not reduce these impacts to a less-than-significant level. Thus, the Proposed Update could result in a considerable contribution to a cumulative impact on cultural resources.

6. Energy Demand

Implementation of reasonably foreseeable compliance responses 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 Proposed Update would not result in a considerable contribution to a cumulative impact relative to construction-related energy demand.

However, long-term operational energy demand impacts associated with the recommended actions would be primarily beneficial, and thus no contributions to a cumulative impact on long-term operational energy demand would occur.

7. Geology and Soils

Implementation of the reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require construction and operational activities associated with new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. 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, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Thus, the Proposed Update could result in a considerable contribution to a cumulative impact on geology and soils.

8. Greenhouse Gases

Implementation of reasonably foreseeable compliance responses 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. As described in Chapter 4, 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 Proposed Update are considered less than significant when considered in comparison to the overall GHG reduction associated with implementation of the Proposed Update.

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

Thus, the Proposed Update would not result in a considerable contribution to a cumulative GHG emissions impact.

9. Hazards and Hazardous Materials

Reasonably foreseeable compliance responses to the recommended actions in the Proposed Update could include construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact locations where construction and operations of new facilities or the modification of existing facilities would occur.

Construction activities may require the transport, use, and disposal of hazardous materials. Construction activities generally use heavy-duty equipment requiring periodic refueling and lubricating. Large pieces of construction equipment (e.g., backhoes, graders) are typically fueled and maintained at the construction site. However, the transport, use, and disposal of hazardous materials would be required to comply with all applicable federal, State and local laws (see Attachment 2 of this EA). In addition, although there is uncertainty as to the exact locations where new facilities could be constructed or where existing facilities could be reconstructed, these would likely occur within footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of manufacturing or industrial uses. As a result, construction-related impacts on hazards and hazardous materials would be less than significant.

In addition, because potential facilities would likely occur within footprints of existing manufacturing facilities, the Proposed Update 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 proposed on hazards and hazardous materials would be less than significant.

Therefore, because the Proposed Update would result in less-than-significant impacts, no contribution to a cumulative hazards or hazardous materials impact would occur.

10. Hydrology and Water Quality

Construction activities and long-term operations associated with reasonably foreseeable compliance responses to the recommended actions could be located 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. 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 Proposed Update could result in a considerable contribution to a cumulative impact to hydrology and water quality.

11. Land Use and Planning

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require both construction and long-term 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. However, facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development these facilities. Thus, implementation of the recommended actions would not be anticipated to divide an established community or conflict with a land use or conservation plan. Therefore, the Proposed Update would not result in a considerable contribution to a cumulative land use planning-related impact.

12. Mineral Resources

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require both the 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. New facilities would likely occur within existing footprints or in areas with consistent zoning, where original permitting and analyses considered these issues, and thus impacts to the availability of a known mineral resource or recovery site would be less than significant. Some of the recommended actions and associated compliance responses could require the extraction of minerals (i.e., lithium or platinum) used to manufacture fuel cell and battery technologies. However, implementation of these measures would not substantially deplete the supply of lithium or platinum and both are currently used in auto manufacturing processes. Therefore, the Proposed Update would not result in a considerable contribution to a cumulative impact to mineral resources.

13. Noise

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update 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 effects of equipment constructed as a result of implementation of recommended actions associated with the Energy Sector and Green Buildings 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 Proposed Update could result in a considerable contribution to a cumulative construction-related noise impact.

14. Population and Housing

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require 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. 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 – 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 Proposed Update would not result in a considerable contribution to a cumulative impact related to population and housing growth.

15. Public Services

Reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update 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. 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 Proposed Update would not result in a considerable contribution to a cumulative impact related to public services.

16. Recreation

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require construction and operations of new or modified facilities or infrastructure. There is uncertainty as to the exact locations of potential new or modified facilities. 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, 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. 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. Therefore, the Proposed Update would not result in a considerable contribution to a cumulative impact related to recreational facilities.

17. Transportation and Traffic

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update could require construction and operations of new or modified facilities or infrastructure. 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 Energy Sector would be potentially significant.

Implementation of the reasonably foreseeable compliance responses under this measure would not, however, result in substantial long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

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 Proposed Update could result in a considerable contribution to a cumulative transportation and traffic-related impact.

18. Utility Service Systems

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the Proposed Update 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 State 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.

At this time, 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 ARB 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 for which it is unknown whether mitigation would be available to reduce the impacts to a less-than-significant level.

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 Proposed Update could result in a considerable contribution to a cumulative impact with respect to utilities and service systems.

C. Growth-Inducing Impacts

As noted above, the Proposed Update would not directly result in any growth in population or housing. Recommended actions discussed in the Proposed Update will ultimately make California a better place to live. There is a possibility of encouraged growth via green jobs and innovative green technologies. California is renowned for its environmentally progressive laws and regulations, and the Proposed Update would contribute to California's effort to improve public health, contribute towards healthy lifestyles and improved quality of life.

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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 recommended actions included in the Proposed First Update to the Climate Change Scoping Plan (Update).

A. Mandatory Findings of Significance

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?

Under CEQA Guidelines section 15065(a), a finding of significance is required if a project "has the potential to substantially degrade the quality of the environment." In practice, this is the same standard as a significant impact on the environment, which is defined in CEQA Guidelines section 15382 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."

As with all of the environmental impacts and issue areas, the precise nature and magnitude of impacts would be highly variable, and would depend on a range of reasonably foreseeable compliance responses that could occur with implementation of the recommended actions in the Proposed Update. The locations of compliance responses, their spatial or aerial extent, and a variety of site-specific factors are not known at this time but would be addressed by environmental reviews to be conducted when specific regulations are proposed by statewide regulatory agencies, or by local or regional agencies with regulatory authority at the project-specific level.

This EA, in its entirety, addresses and discloses potential environmental impacts associated with the recommended actions in the proposed Update, including direct, indirect, and cumulative impacts in the following resource areas:

- Aesthetics
- Agriculture and Forest Resources
- Air Quality
- Greenhouse Gas Emissions
- Biological Resources
- Cultural Resources

- Energy Demand
- Geology and Soils
- 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 EA discloses potential environmental impacts, the level of significance prior to mitigation, mitigation measures, and the level of significance after the incorporation of mitigation measures.

a) Impacts on Species

Under CEQA Guidelines section 15065(a)(1), 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 the potential to (1) substantially reduce the habitat of a fish or wildlife species; (2) cause a fish or wildlife population to drop below self-sustaining levels; or (3) substantially reduce the number or restrict the range of an endangered, rare, or threatened species. Chapter 4 of this EA addresses typical construction impacts that could occur to biological resources, including the reduction of fish or wildlife habitat, the reduction of fish or wildlife populations, and the reduction or restriction of the range of special-status species.

b) Impacts on Historical Resources

CEQA Guidelines section 15065(a)(1) states that 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 the potential to eliminate important examples of a major period of California history or prehistory. CEQA Guidelines section 15065(a)(1) amplifies Public Resources Code section 21001(c) requiring that major periods of California history are preserved for future generations. It also reflects the provisions of Public Resources Code section 21084.1 requiring a finding of significance for substantial adverse changes to historical resources. CEQA Guidelines section 15064.5 establishes standards for determining the significance of impacts to historical resources and archaeological sites that are a historical resource. Chapter 4 of this EA addresses typical construction impacts that could occur related to California history and prehistory, historic resources, archaeological resources, and paleontological resources.

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

As required by CEQA Guidelines section 15065, 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. As defined in CEQA Guidelines section 15065(a)(3), 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." 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 EA.

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

Consistent with CEQA Guidelines section 15065(a)(4), 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 the potential to cause substantial adverse impacts on human beings, either directly or indirectly. 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 particular individuals. While changes to the environment that could indirectly affect human beings would be represented by all of 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 EA.

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7.0 ALTERNATIVES ANALYSIS

This section provides an overview of the regulatory requirements and guidance for alternatives analyses under the California Environmental Quality Act (CEQA), a description of each of the alternatives to the proposed project (i.e., the Proposed First Update to the Climate Change Scoping Plan [Proposed Update]), a discussion of whether and how each alternative meets the project's objectives, and an analysis of each alternative's environmental impacts.

A. Approach to Alternatives Analysis

The Air Resources Board's (ARB) certified regulatory program (Cal. Code Regs., tit. 17, §§ 60000 – 60008) requires that where a contemplated action may have a significant effect on the environment, a staff report shall be prepared in a manner consistent with the environmental protection purposes of ARB's regulatory program and with the goals and policies of CEQA. Among other things, the staff reports must address feasible alternatives to the proposed action that would substantially reduce any significant adverse impact identified.

The regulation 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 which would substantially reduce such adverse impact. For purposes of this section, "feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors, and consistent with the state board's legislatively mandated responsibilities and duties. (Cal. Code Regs., tit. 17, § 60006.)

While ARB, by virtue of its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the State CEQA Guidelines, the Guidelines nevertheless contain useful information for preparation of a thorough and meaningful alternatives analysis. CEQA Guidelines section 15126.6(a) speaks 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 a 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 ARB's regulatory requirements.

Alternatives considered in an environmental document should be potentially feasible and should attain most of the basic project objectives. It is, therefore, critical that the alternatives analysis define the project's objectives. In this case, the objectives are established by AB 32. Under AB 32, ARB is required to update the Scoping Plan "for achieving the maximum technologically feasible and cost-effective reductions of GHG

emissions at least once every five years." (Health & Saf. Code, § 38561, subd. (h).) The project objectives are described further below in Section C. of this Chapter.

The range of alternatives is governed by the "rule of reason," which requires evaluation of only those alternatives "necessary to permit a reasoned choice." (Cal. Code Regs., tit. 14, § 15126.6, subd. (f).) Further, an agency "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." (Cal. Code Regs., tit. 14, § 15126.6, subd. (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. Selection of Range of Alternatives

This chapter evaluates a reasonable range of alternatives to the Proposed Update that could reduce or eliminate the project's significant effects on the environment, while meeting most of the basic project objectives. (Cal. Code Regs., tit. 14, § 15126.6, subd. (a).) Pursuant to ARB's certified program, this chapter also contains an analysis of each alternative's feasibility and the likelihood that it will substantially reduce any significant adverse environmental impacts identified in the impact analysis contained in Chapter 4 of this EA. (Cal. Code Regs., tit. 17, §§ 60005(b), 60006.)

As described earlier, the Proposed Update builds upon the approach of the initial Scoping Plan by recommending a balanced mix of broad-based sector strategies and recommended actions for the State to ensure that California remains on track to meet the near-term 2020 GHG emissions limit and continues on a downward GHG emissions trajectory consistent with achieving the State's long-term climate stabilization objectives, while maintaining a vibrant, clean, and sustainable California economy. Likewise, suitable alternatives considered in this EA need also to be broad-based, comprehensive approaches that could meet the basic project objectives, while reducing or eliminating the project's significant effects on the environment.

While the Proposed Update recognizes the need for broad-based strategies that require continued changes to how the State generates, transmits, and consumes electricity; how people and goods are transported; how communities are planned and built; the conveyance, distribution and consumption of water and other resources; and the State's management of its vast natural and agrarian lands; however, specific actions are not yet fully defined at this stage of planning. The level of detail for each alternative must reflect that the project is a broad plan and, accordingly, the analysis cannot provide the level of detail that will be contained in subsequent environmental documents that would be prepared when each of the Proposed Update's recommended actions or regulations are subsequently developed and implemented by ARB or other lead agencies. (See Cal. Code Regs., tit. 14, §15152.)

ARB has identified a reasonable range of three alternatives that allow the public and Board to understand the differences between different approaches. GHG emission reduction measures ongoing or already implemented as part of the initial Scoping Plan are considered a part of the No-Project Alternative. Since these programs are already underway and reducing emissions at this time, they are reasonably expected to continue. ARB did not consider dismantling adopted components of the initial Scoping Plan (e.g., Advance Clean Cars Regulation, Cap-and-Trade Regulation) as feasible alternatives (or components of alternatives) to the Proposed Update because removing existing ongoing programs would be contrary to the basic project objective of reducing GHG emissions. In addition to the No Project Alternative, ARB made a good faith effort to identify other potentially feasible project alternatives. This included examining comments received at the public workshops held in June, July, and October of 2013, and at the Board hearings held in October 2013 and February 2014 to determine if any commenters suggested potentially feasible alternatives. While commenters made suggestions for particular components of recommended actions within the key economic sectors, no comments suggested an alternative, broad-based comprehensive approach to the project itself. ARB staff found no comments suggesting an alternative comprehensive approach to meet the State's long-term goals.

Despite the challenge of identifying alternative approaches to the project as a whole, rather than just alternatives to components within the project, ARB staff was able to identify two feasible action alternatives in addition to the No Project Alternative, a Reduced-Intensity Project Alternative, and Extending the Cap-and-Trade Regulation to All Economic Sectors Alternative. These are described more fully below. These alternatives to the project as a whole do not alter the basic nature of the project, while providing sufficient information to allow a comparison with the proposed project.

C. Project Objectives

The project objectives described in Chapter 2, Project Description, are summarized below. These objectives are derived from the requirements of AB 32. The analysis that follows in Section E of this chapter includes a discussion of the degree to which each alternative meets these basic project objectives.

1. To update the State's Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions at least once every five years (Health & Saf. Code, § 38561, subd. (h));

2. Pursue measures to maintain and continue reductions in emissions of GHG beyond 2020 (Health & Saf. Code § 38551(b));

3. Pursue measures that implement reduction strategies covering the state's GHG emissions in furtherance of California's mandate to reduce GHG emissions to 1990 levels by 2020;

4. Reduce fossil fuel use – to reduce California's reliance on fossil fuels and diversify energy sources while maintaining electric system reliability;

5. Design an enforceable, amendable program – to design a program that is enforceable and that is capable of being monitored and verified;

6. Ensure emission reductions – to pursue emissions reductions that are real, permanent, quantifiable, verifiable and enforceable;

7. Achieve technologically feasible and cost-effective reductions – to achieve the maximum technologically feasible and cost-effective reductions in GHG emissions, in furtherance of achieving the statewide GHG emissions limit (Health & Saf. Code, § 38562, subds. (a) and (c));

8. Avoid disproportionate impacts – to ensure, to the extent feasible, that activities undertaken to comply with the measures do not disproportionately impact low income communities (Health & Saf. Code, § 38562, subd. (b)(2));

9. Complement existing air standards – to ensure, to the extent feasible, that activities undertaken pursuant to the measures complement, and do not interfere with, efforts to achieve and maintain national and California Air Quality Attainment Standards and to reduce toxic air contaminant (TAC) emissions (Health & Saf. Code, § 38562, subd. (b)(4));

10. Consider a broad range of public benefits – to consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health (Health & Saf. Code, § 38562, subd. (b)(6));

11. Minimize administrative burden – to minimize, to the extent feasible, the administrative burden of implementing and complying with the measure (Health & Saf. Code, § 38562,subd. (b)(7));

12. Weigh relative emissions – to consider, to the extent feasible, the contribution of each source or category of sources to statewide emissions of GHGs (Health & Saf. Code, § 38562, subd. (b)(9));

13. Maximize co-benefits – to maximize, to the extent feasible, additional environmental and economic benefits for California, as appropriate (Health & Saf. Code, § 38570, subd. (b)(3)); and

14. Avoid duplication – to ensure that electricity and natural gas providers are not required to meet duplicative or inconsistent regulatory requirements (Health & Saf. Code, § 3850, subd. (g) and § 38561, subd. (a)).

D. 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 meets the basic project objectives, and the degree to which each alternative avoids potentially significant impacts identified in Chapter 4.

1. Alternative 1: No-Project Alternative

a) Alternative 1 Description

ARB 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 Update. ARB's certified regulatory program does not mandate consideration of a "No-Project Alternative." (Cal. Code Regs., tit. 17, § 60006.) Under ARB's certified program, the alternatives considered, among other things, must be "consistent with the state board's legislatively mandated responsibilities and duties." (Cal. Code Regs., tit. 17, § 60006.)

Moreover, it is not clear that ARB would have legal authority to pursue the No-Project Alternative. ARB is legislatively mandated to update the Scoping Plan at least once every five years to achieve "the maximum technologically feasible and cost-effective reductions of GHG …." (Health & Saf. Code, § 38561, subd. (h).)

The No-Project Alternative is included only to assist in the analysis and consideration of this portion of the Proposed Update and the action alternatives. It is useful to include a "No-Project Alternative" in this analysis for the same reasons that this type of alternative is called for in the State CEQA Guidelines. As noted in the CEQA Guidelines, "the purpose of describing and analyzing a 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." (Cal. Code Regs., tit. 14, § 15126.6, subd. (e)(1).) The No-Project Alternative also provides an important point of comparison to understand the potential environmental benefits and impacts of the other alternatives.

Alternative 1 in this analysis describes a reasonably foreseeable scenario, if ARB did not approve the Proposed Update. Under this No-Project Alternative, those measures included in the initial Scoping Plan that are already being implemented, as well as those measures enacted under authority outside of AB 32, would continue to be implemented. For a complete description of the status of the initial Scoping Plan measures and related implementation efforts, please refer to the descriptions of each Scoping Plan sector contained in Chapter 4, section A.

The No-Project Alternative does not contemplate that there would be no further action by ARB or other state agencies related to the reduction of GHG emissions. Some of the recommended actions contained in the Proposed Update may occur as a result of subsequent regulatory actions by ARB or other agencies under separate statutory authority regardless of their inclusion in the Proposed Update.

b) Alternative 1 Impact Discussion

i) Objectives

The No-Project Alternative would not meet many of the project objectives listed in Chapter 2 (and reiterated above). The No-Project Alternative fails to provide maximum technologically feasible and cost-effective reductions in GHG emissions, in furtherance of achieving and maintaining the 1990 statewide GHG emissions limit (Objective 7) and continuing reductions beyond 2020 (Objective 2).

The No-Project Alternative is not consistent with Project Objectives 8, 9, 10 and 13, which address achieving additional air quality and health co-benefits. As discussed in the Proposed Update, there is a need to reduce short-lived climate pollutants such as black carbon and methane. The recommended actions in the Proposed Update would contribute substantially to achieving the stated objective of preventing increases in other pollutant emissions, including criteria air pollutants (CAPs) or toxic air contaminants (TACs). Therefore, the No-Project Alternative is not consistent with this objective to achieve and maximize CAP and TAC emission reduction co-benefits.

Furthermore, the No-Project Alternative is not consistent with Project Objectives 1 and 2, which addresses the need to update the plan to achieve the maximum technologically feasible and cost-effective GHG reductions and to maintain and continue reductions in GHG emissions beyond 2020. The stated objective of the Plan Update is setting California on track to meet its longer-term climate goal of achieving climate stabilization necessary to protect the existing environment of California. As indicated in the Proposed Update, Executive Order S-3-05 and Governor Brown's Executive Order (EO) B-16-2012 establish long-term climate goals for California to reduce GHG emissions to 80 percent below 1990 levels by 2050 (EO B-16-2012 is specific to the transportation sector). These 2050 goals are consistent with an Intergovernmental Panel on Climate Change (IPCC) analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million carbon dioxide equivalent (CO_2e) and reduce the likelihood of catastrophic climate change. Progressing toward California's long-term climate goals will require that GHG emission reduction rates be significantly accelerated through a continuation of existing policies and implementation of new ones to encourage market adoption of the cleanest, most efficient technologies. (See Chapter II of the Proposed Update, "Latest Understanding of Climate Science.")

ii) Environmental Impacts

The No-Project Alternative includes GHG emission reduction measures that are ongoing or already implemented as part of the initial Scoping Plan, or developed under authorities additional to AB 32. Direct and indirect environmental impacts associated with implementation of these measures were analyzed in the 2008 Functional Equivalent Document (FED) and 2011 FED Supplement, and are incorporated by reference and summarized in Attachment 3 of this EA. The No-Project Alternative, therefore, would still result in potential adverse environmental impacts as summarized in the tables in Attachment 3.

The No-Project Alternative would, however, avoid the additional potential environmental impacts associated with the recommended actions in the Proposed Update identified in Chapter 4 of this document. These include potential impacts resulting from short-term construction and long-term operational impacts that may occur as a result of activities carried out in response to regulations or programs enacted to implement the recommended actions. The resource areas affected include aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazardous materials, hydrology and water quality, noise, transportation/traffic, and utilities and service systems, as described in Chapter 4 and summarized in the table in Attachment 1.

2. Alternative 2: Reduced-Intensity Project Alternative

a) Alternative 2 Description

Under Alternative 2, the Reduced-Intensity Alternative, only some of the recommended actions in the economic sectors of the Proposed Update would be approved, based on the goal of reducing or avoiding potentially significant impacts.

As described in Chapter 4 and shown in the impact summary table in Attachment 1, recommended actions in most of the nine economic sectors in the Proposed Update would result in a number of potentially significant and unavoidable impacts after mitigation. The impact analysis in Chapter 4 does not focus on impacts for individual actions recommended in each sector, but rather for a set of reasonably foreseeable compliance responses to the range of recommended actions identified in each sector. Furthermore, there is considerable variation in each sector of the Proposed Update in terms of potentially significant and unavoidable impacts in each resource, compared to beneficial or less-than-significant impacts. Thus, Alternative 2 could be defined in a number of different ways, as discussed below.

- Only one of the sectors in the Proposed Update (Agriculture) would result in less-than-significant or beneficial impacts in all resource areas. For the remaining eight sectors, potentially significant and unavoidable impacts defined for many of the resource areas, with variability in terms of which resource areas the impacts would occur. Alternative 2 could thus limit the proposed project to implementing only the recommended actions in the Agriculture Sector, which would strictly avoid all potentially significant and unavoidable impacts in the Proposed Update. This would result in a much smaller set of recommended actions in one economic sector, compared to implementing the full set of actions in the nine sectors contained in the Proposed Update.
- For a few specific environmental resource areas, such as air quality, recommended actions in some of the sectors would result in beneficial or less-than-significant long-term operational impacts, while recommended actions in other sectors would result in potentially significant and unavoidable long-term operational air quality impacts. The sectors in which recommended actions would result in beneficial or less-than-significant, long-term

operational air quality impacts include Energy, Agriculture, Water, Short-Lived Climate Pollutants, and Green Buildings. Alternative 2 could thus limit the proposed project to implementing only the recommended actions in these six sectors to avoid long-term operational air quality impacts.

- Similar to the previous air quality scenario, a reduced-intensity scenario for Alternative 2 could be developed for other environmental resource topics where the potential impacts associated with recommended actions in each sector may vary, such as long-term operational impacts on Utilities and Service Systems, in which case only Energy and Agriculture would avoid potentially significant impacts.

b) Alternative 2 Impact Discussion

i) Objectives

The reduced number of recommended actions under any of the scenarios described above under Alternative 2 would provide fewer GHG emission reductions in furtherance of achieving and maintaining the statewide 2020 GHG emissions limit and continuing reductions in emissions of GHG emissions beyond 2020. Therefore, this alternative is considerably less effective at meeting objectives 1, 2, 3 and 7.

Alternative 2 would be consistent with the remaining project objectives, but would achieve the outcomes desired under those objectives to a lesser extent, and potentially much lesser extent, depending on the scenario, than the Proposed Update. Many of the recommended actions included in the Proposed Update also contribute to achieving the stated objective of preventing increases in other pollutant emissions, such as CAPs or TACs, including black carbon and methane which are short-lived climate pollutants, consistent with Project Objectives 8, 9, 10 and 13. Alternative 2 would not achieve CAP and TAC emission reduction co-benefits in any of the scenarios in which recommended action in certain sectors would be excluded, such as in the Transportation Sector.

Therefore, while Alternative 2 meets some of the basic project objectives, it would likely achieve substantially fewer GHG emission reductions and overall is less effective at achieving the project objectives compared to the Proposed Update.

ii) Environmental Impacts

As described above, Alternative 2 could eliminate a range of recommended actions identified in the Proposed Update for which potentially significant and unavoidable impacts were identified in Chapter 4, depending on which reduced-intensity scenario would be selected.

The only scenario in which all potentially significant and unavoidable impacts would be avoided is if ARB adopted and implemented the Proposed Update with recommended actions only in the Agriculture Sector. Under that scenario, all potentially significant construction-related and long-term operation impacts to aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, geology and soils,

hazardous materials, hydrology and water quality, noise, transportation/traffic, and utilities and service systems, would be avoided.

Under the other scenarios described above, only the potentially significant impacts in certain resource areas would be avoided (e.g., air quality or utilities and service systems), based on approving recommended actions in specific sectors. For other resource areas, the potentially significant and unavoidable environmental effects would remain.

3. Alternative 3: Extend the Cap-and-Trade Regulation to All Economic Sectors Alternative

a) Alternative 3 Description

Under Alternative 3, Extend the Cap-and-Trade Regulation to All Economic Sectors, ARB would broaden the reach of the State's market-based Cap-and-Trade Regulation to include regulation of a full range of economic sectors under the emissions cap, rather than the focused application to specific covered entities that is the basis for the existing program. Any GHG emission reductions that would have otherwise occurred through implementation of specific actions or regulations in the "uncapped sectors" under the Proposed Update post-2020 would become covered under the declining emissions cap, along with those currently in the capped sectors. The current "uncapped sectors" includes the following economic sectors (or specific sources within economic sectors): Agriculture, Forests, High-GWP F-gases, Oil and Gas Extraction and Transmission, and Recycling and Waste.

The Proposed Update builds upon the initial Scoping Plan strategy of implementing a broad set of recommended actions to reduce GHG emissions across economic sectors, along with a statewide Cap-and-Trade Regulation that applies a firm and declining emission reduction cap on a focused set of covered entities that represent approximately 85 percent of total statewide GHG emissions. The Proposed Update also includes a recommendation to continue the Cap-and-Trade Regulation beyond 2020, but does not broaden its reach to additional sectors. Thus, the essential difference between the Proposed Update and Alternative 3 is that the Cap-and-Trade Regulation would be implemented across all economic sectors, and not just the limited covered entities under the current program. ARB or other lead agencies could still pursue any of the recommended actions under the Proposed Update, in addition to implementing the broader Cap-and-Trade Regulation under this Alternative, because changes to the Cap-and-Trade Regulation would not replace the recommended actions.

Similar to the existing Cap-and-Trade Regulation, under Alternative 3 the number of allowances issued per year would be steadily reduced under the declining emissions cap on all sectors to meet the State's 2050 emission goals. Some smaller sources of GHG emissions, such as high-global warming potential (GWP) fluorinated gases (F-gases), could be regulated upstream at the distribution level. However, other smaller emission sources, such as methane emitters, would be regulated on a source-by-source basis.

Reasonably foreseeable compliance responses would be similar to those under the current Cap-and-Trade Regulation and addressed in the FED prepared for the Cap-and-Trade Regulation in 2010. This would likely include continued implementation of projects under currently adopted compliance offset protocols (i.e., U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and Ozone-Depleting Substance [ODS] Compliance), as well as the development of additional compliance offset protocols and associated offset projects consistent with the goals and procedures of the existing Cap-and-Trade Regulation. However, because the program would be extended to all economic sectors in the State, the supply of available offsets in the currently-uncapped sectors would be virtually eliminated, as the only projects eligible for offsets would be in sectors not regulated or capped in the State.

b) Alternative 3 Impact Discussion

i) Objectives

Extending the Cap-and-Trade Regulation to all economic sectors under this alternative would be consistent with a number of the project objectives. The State would still pursue GHG emission reductions through this program in all economic sectors to maintain and continue reductions beyond 2020 (Objectives 2 and 3). Reductions in fossil fuel use, diversification of energy sources and maintaining electric system reliability would likely continue (Objective 4).

Extending the Cap-and-Trade Regulation to the currently uncapped sectors would require ongoing enforcement, monitoring and verification by ARB. This could prove difficult as both the technical methodology and resources required to ensure that GHG emission reductions in these sectors are real, permanent, quantifiable, verifiable and enforceable, are not yet well-defined. Therefore, this alternative could fail to meet Objectives 5 and 6. For related reasons, this alternative could fail to meet Objective 11 due to potential increases in administrative burden for both implementation and compliance with the Regulation.

Objectives 7 through 9 could potentially be achieved by this alternative, as the Cap-and-Trade Program would continue to allow covered entities to achieve maximum technologically feasible and cost-effective reductions in GHG emissions, avoid disproportionate impacts, and complement existing air standards.

A number of public benefits and co-benefits could still be achieved by a broadened Cap-and-Trade Regulation consistent with Objectives 10 and 13; however, the opportunity to align and implement specific recommended actions in the Proposed Update that would support or complement other statewide initiatives and maximize a broad range of benefits to the economy, environment, and public health would be diminished.

ii) Environmental Impacts

Reasonably foreseeable compliance responses under this alternative would likely be similar to those under the current Cap-and-Trade Regulation, and, therefore, any potentially significant impacts analyzed in the 2010 Cap-and-Trade FED would likely be

similar under Alternative 3. Potentially significant impacts would also be similar to those disclosed in this EA for the recommended actions in the Proposed Update, because GHG emission reductions would still occur as a result of implementing some or all of the recommended actions in all sectors, along with similar or additional compliance responses under a broadened Cap-and-Trade Regulation under this alternative.

It is not expected that any of the potentially significant and unavoidable impacts identified in this EA for the Proposed Update would be reduced or avoided by Alternative 3, because of the similarity in the scope and types of reasonably foreseeable compliance responses between the Proposed Update and this alternative.

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ATTACHMENT 1: SUMMARY OF IMPACTS BY SECTOR

Attachment 1: Summary of Impacts by Sector									
	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation
Aesthetics									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Agriculture and Forest Resources									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	SU	SU	B	SU	SU	SU	SU	SU	See Attachment 3
Air Quality									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	LTS	SU	B	LTS	LTS/SU*	SU	LTS	B	See Attachment 3
Biological Resources									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	SU	SU	B	SU	SU	LTS	SU	SU	See Attachment 3
Cultural Resources									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	NA	NA	NA	NA	NA	NA	NA	NA	See Attachment 3
Energy Demand									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Long-Term Operational Impacts	B	B	B	LTS	B	B	LTS	B	See Attachment 3

Attachment 1: Summary of Impacts by Sector									
	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation
Geology and Soils									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Greenhouse Gas									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Long-Term Operational Impacts	B	B	B	B	B	LTS	B	B	See Attachment 3
Hazards and Hazardous Materials									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	SU	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Hydrology and Water Quality									
Short-Term Construction Impacts	SU	SU	B	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	SU	SU	B	SU	SU	B	SU	SU	See Attachment 3
Land Use Planning									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3

Attachment 1: Summary of Impacts by Sector									
	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation
Mineral Resources									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Noise									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	SU	LTS	LTS	LTS	LTS	SU	LTS	SU	See Attachment 3
Population and Housing									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Public Services									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Recreation									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3
Transportation/Traffic									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	See Attachment 3

Attachment 1: Summary of Impacts by Sector									
	Energy Sector	**Transportation Sector**	**Agriculture Sector**	**Water Sector**	**Waste Management Sector**	**Natural and Working Lands Sector**	**Short-Lived Climate Pollutants Sector**	**Green Buildings**	**Cap-and-Trade Regulation**
Utilities and Service Systems									
Short-Term Construction Impacts	NA	NA	NA	NA	NA	NA	NA	NA	See Attachment 3
Long-Term Operational Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	See Attachment 3

Notes: B = Beneficial; LTS = Less Than Significant; NA = Not Applicable; SU = Potentially Significant and Unavoidable After Mitigation.
*Long-term operational impacts were identified as LTS, but odor-related impacts were identified as significant and unavoidable in the Waste Management sector.

ATTACHMENT 2: ENVIRONMENTAL AND REGULATORY SETTING

1.0 AESTHETICS

A. Existing Conditions

California, by virtue of its size, setting, and topographic and climate 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.

Aesthetic value can be affected by visibility, which is directly related to the presence of airborne particles. Visibility-reducing particles consist of suspended particulate matter, a complex mixture of tiny particles consisting of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. Particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt (ARB 2009).

B. Regulatory Setting

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

Table 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 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.
Bureau of Land Management (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.
Moving Ahead for Progress in the 21st Century (MAP-21)	The MAP-21 was signed into law in July 2012. It effectively supersedes the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
Natural Historic Preservation Act (NHPA)	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

Table 1: Applicable Laws and Regulations for Aesthetic Resources	
Applicable Regulations	**Description**
	effects … include…: Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features." (36 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 ten 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.
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.

C. Agricultural and Forest Resources

1. Existing Conditions

The California Department of Conservation's (DOC's) FMMP inventories agricultural resources based on soil quality and land use within California. 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."

As of 2008, of California's approximately 100 million acre of land, 31.6 million acres are used for agriculture. Of this, 19.2 million acres are grazing land and 12.4 million acres are cropland. Farmland considered to be prime, unique or of statewide importance covers 12 million acres (DOC 2008). California has been the top agricultural producer of all states in the U.S. for approximately 50 years. The DOC determined that farm and grazing land decreased by more than 1.3 million acres between 1984 and 2008. Conversion to urban land contributes more than 1.04 million acres over this time period.

Of the 85 million acres of wildlands in California, nearly 17 million are commercial forest land, half privately-owned and half government-owned. Forest land grows 3.8 billion board feet annually. Approximately 2 billion board feet of timber is harvested per year. State wild lands also provide valuable watershed, wildlife habitat, and recreation resources.

2. Regulatory Setting

Table 2 below provides a general description of applicable laws and regulations that may pertain to agriculture and forest resources associated with the Air Resources Board (ARB) 2013 Scoping Plan Update

Table 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 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

Table 2: Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
	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.
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.
Farmland Mapping and Monitoring Program (FMMP) (Government Code Section 65570, PRC Section 612)	Under the FMMP, the California 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.
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 four 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 preservation, open space and recreation. Scoping Plan projects located within these lands would be subject to the State Lands Commission permitting process.

Table 2: Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
Local	
Open Space Element	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.

2.0 AIR QUALITY

A. Existing Conditions

Federal, State, and local governments all share responsibility for reducing air pollution. ARB is California's lead air agency and controls emissions from mobile sources, fuels, and consumer products, as well as air toxics. ARB also coordinates local and regional emission reduction measures and plans that meet federal and State air quality limits. At the federal level, the US EPA has oversight of State programs. In addition, US EPA alone establishes emission standards for certain mobile sources such as ships, trains, and airplanes.

1. Criteria Air Pollutants

Concentrations of emissions of criteria air pollutants (CAPs) 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 3.

Table 3: 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	Increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	Permeability of respiratory epithelia, possibility of permanent lung impairment

Table 3: Sources and Health Effects of Criteria Air Pollutants			
Pollutant	**Sources**	**Acute[1] Health Effects**	**Chronic[2] Health Effects**
	combustion of fuels		
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, 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 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: EPA 2011a.

2. Ozone

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Emissions of the ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. During the last 20 years the maximum amount of ROG and NO_X over an 8-hour period decreased by 17 percent. However, most counties in California are in nonattainment for ozone.

3. Nitrogen Dioxide

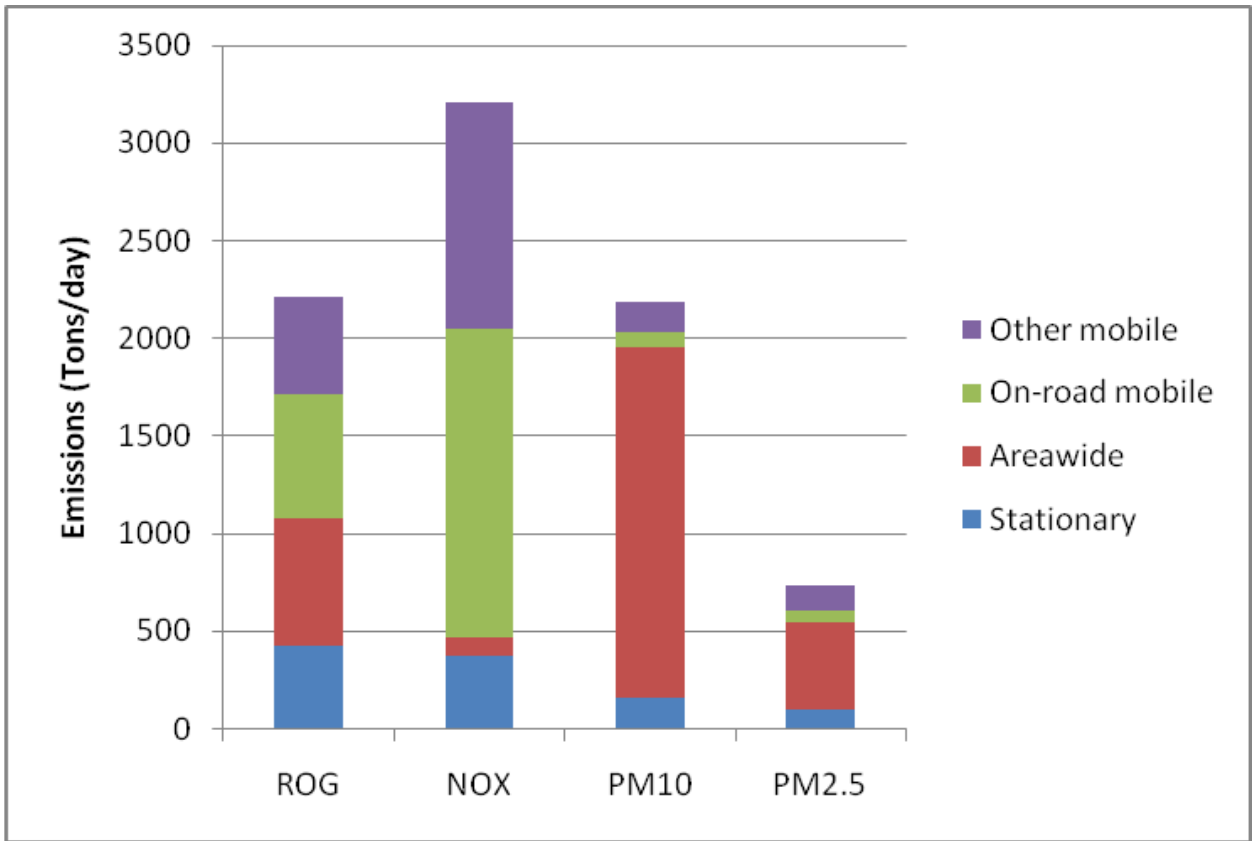
NO_2 is a brownish, highly-reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which 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 (EPA 2011a).

4. 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 (ARB 2009). $PM_{2.5}$ 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. $PM_{2.5}$ 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} (ARB 2009).

5. Emissions Inventory

Exhibit 1 summarizes emissions of CAPs within California for various source categories. According to California's emissions inventory, mobile sources are the largest contributor to the estimated annual average for air pollutant levels of ROG and NO_X accounting for approximately 51 percent and 86 percent respectively, of the total emissions. Area wide sources account for approximately 89 percent and 73 percent of California's PM_{10} and $PM_{2.5}$ emissions, respectively (ARB 2008).



Source: ARB 2008
Exhibit 1 California 2008 Emissions Inventory

6. 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.

According to the *California Almanac of Emissions and Air Quality* (ARB 2009), the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most predominant being particulate-exhaust emissions from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single

substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike some TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, paradichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Since 1990, the health risk associated with diesel PM has been in California has reduced by 52 percent. Overall, levels of most TACs, except paradichlorobenzene and formaldehyde, have decreased since 1990 (ARB 2009: Chapter 5).

B. Regulatory Setting

Table 4: Applicable Laws and Regulations for Air Quality

Regulation	Description
Federal	
Clean Air Act (CAA) (40 CFR)	CAA, which was last amended in 1990, requires the United States Environmental Protection Agency (US EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act 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. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. US EPA Office of Air Quality Planning and Standards (OAQPS) has set NAAQS for six principal pollutants, which are called "criteria" pollutants. Title III of the CAA directed the US EPA to promulgate national emissions standards for Hazardous Air Pollutants (NESHAP). The CAA also required the US EPA to promulgate vehicle or fuel 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

Table 4: Applicable Laws and Regulations for Air Quality	
Regulation	**Description**
	further reduce mobile-source emissions.
SmartWay	SmartWay is a US 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.
Other Applicable Federal-Level Regulations	This includes all other applicable regulations at the federal level for portions of the project area that are outside of the U.S. (e.g., Canada).
State	
California Clean Air Act (CCAA) CCR (Titles 13 and 17)	ARB 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 the ARB to establish California ambient air quality standards (CAAQS).
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., AB 1807and AB 2588).

3.0 BIOLOGICAL RESOURCES

A. Existing Conditions

California's diverse topography and climate have given rise to a remarkable diversity of habitats and a correspondingly diverse array of both plant and animal species. California has more species than any other state in the United States and also has the greatest number of endemic species (i.e., species that occur only in the State)

Geographic and climatic forces have shaped the State's topography and soils. Glaciation, sedimentary and volcanic deposits, movement along fault zones, the uplift of

subterranean rock and sediment layers, and gradual erosion have created unique topographical features and a mosaic of bedrock and soil types.

The state's geography and topography have created distinct local climates. North to south, the state extends for over 500 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. Along the northern coast there is abundant precipitation, and ocean air produces foggy, moist conditions. High mountains have cool conditions, with a deep winter snow pack. Desert conditions exist in the rain shadow of the mountain ranges.

The exceptional variation in landscape features, latitudinal range, geological substrates and soils, and climatic conditions supports alpine meadows, desert scrub, coastal wetlands, sandy beaches, dunes and bluffs, oak woodlands, diverse grasslands, moist redwood forests, spring-fed lakes, and freshwater streams, rivers, and marshes.

1. Plant Diversity

California leads the nation in numbers of native and endemic plant species. Its 5,047 native plant species represent 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.

The state's native flora includes many unusual species. The giant sequoia, an ancient species that has survived from the Tertiary Age, is one of the most massive living organisms known. Coastal redwoods are the tallest trees in the world, reaching as high as 321 feet, taller than a 30-story building. A bristlecone pine in California's White Mountains, called Methuselah, at 4,767 years of age, has lived 1,000 years longer than any other known tree. California is home to the smallest flowering plant in existence, the pond-dwelling water-meal, less than one-tenth of an inch across. The state also supports nine species of carnivorous plants, including sundews, butterworts, and the California pitcher plant. Numerous species have adapted to grow on serpentine soils that are low in calcium, high in magnesium, and full of chromium, nickel, and other metals toxic to other plant species. Closed-cone conifer species, such as pygmy cypress and some chaparral plants, need hot fires to complete their life cycles.

California contains examples of most of the major biological provinces, or biomes, in North America, including grassland, shrubland, deciduous forest, coniferous forest, tundra (alpine), mountains, deserts, rainforest (temperate), marine, estuarine, and freshwater habitats. Each of these biomes contains many different types of plant communities, such as redwood forests, vernal pool wetlands, or blue oak woodlands. Altogether, the state supports 81 types of forests, 107 types of shrublands, and 52 types dominated by herbaceous plants, in addition to 27 other types of vegetation. Some of California's plant species and communities, such as mixed conifer forests, chamise chaparral, and creosote scrub, are widespread. Others are highly restricted in their

distributions, such as unique stands of Crucifixion-thorn, Gowen cypress, Hinds walnut, and Torrey pine.

Some parts of the state are particularly rich in plant species diversity. Areas with the greatest number of plant species are the Klamath and inner North Coast ranges, the high Sierra Nevada, the San Diego region, and the San Bernardino Mountains. Other regions with considerable plant diversity are the outer North and Central Coast Ranges, the Cascade Range, the Sierra Nevada foothills, and the western Transverse Range (CDFW 2007).

2. Wildlife Diversity

California's diverse natural communities provide a wide variety of habitat conditions for wildlife. The state's wildlife species include 84 species of reptiles (30 percent of the total number found in the United States); 51 species of amphibians (22 percent of U.S. species); 67 species of freshwater fish (8 percent of U.S. species); 433 species of birds (47 percent of U.S. species); and 197 mammal species (47 percent of U.S. species). Seventeen species of mammals, 17 species of amphibians, and 20 species of freshwater fish are endemic to California.

Twenty-four habitats—including valley foothill riparian, mixed conifer, freshwater wetlands, mixed chaparral, and grasslands in the state—support more than 150 terrestrial animal species each. Oak woodlands also are among the most biological diverse communities in the state, supporting 5,000 species of insects, more than 330 species of amphibians, reptiles, birds and mammals, and several thousand plant species. Other community types may be especially important to a particular species or species group. For example, California's rocky offshore islands typically support a limited number of species but are nonetheless important habitat for those species that depend on them for nesting; the islands host some of the largest breeding colonies of seabirds in the U.S. In addition, California is part of the Pacific Flyway, an avian migratory pathway that stretches along the Pacific Coast from Mexico north to Alaska and into Siberia, Russia (CDFW 2007).

B. Regulatory Setting

Table 5: Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
Federal	
Federal Endangered Species Act	Designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat.
Migratory Bird Treaty Act	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)	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
	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 regional water quality control board (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	Requires permit or letter of permission from USACE prior to any work being completed within navigable waters.
US EPA Section 404 (b)(1) Guidelines	Requires the USACE to analyze alternatives in a sequential approach such that the USACE must first consider avoidance and minimization of impacts to the extent practicable to determine whether a proposed discharge can be authorized.
California Desert Conservation Area Plan (CDCA)	Comprises one of two national conservation areas established by Congress at the time of the passage of the. FLPMA outlines how BLM would manage public lands. Congress specifically provided guidance for the management of the CDCA 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.
Executive Order 13112, “Invasive Species,” February 3, 1999	Federal agencies are mandated to 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.
Executive Order 11988, “Floodplain Management,” May 24, 1977	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.
Executive Order 11990, “Protection of Wetlands,” May 24, 1977	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.
Executive Order 13186, “Responsibilities of Federal Agencies to	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

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
Protect Migratory Birds," January 10, 2001	Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) that shall promote the conservation of migratory bird populations.
Wild Free-Roaming Horses and Burros Act	Provides for the protection of wild free-roaming horses and burros. Directs BLM and the U.S. Forest Service (USFS) to manage wild horses and burros on lands under their jurisdiction.
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 (BLM 2001),	Establishes special status species policy on BLM land for plant and animal species and the habitats on which they depend. The policy refers species designated by the BLM State Director as sensitive.
Listed Species Recovery Plans and Ecosystem Management Strategies	Provides guidance for the conservation and management of sufficient habitat to maintain viable populations of listed species and 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, Recovery Plan for Upland Species of the San Joaquin
State	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species.
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.
Z'berg-Nejedly Forest Practice Act	Ensures that logging on timberland is performed in a manner that will preserve and protect fish, wildlife, forests and streams, enforced by the California Department for Forestry and Fire Protection (CAL FIRE).
California Forest Practice Rules 2010	State Board of Forestry and Fire Protection has authority delegated by legislature to adopt forest practice and fire protection regulations on nonfederal lands. These regulations carry out California legislature's mandates to protect and

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
	enhance the State's unique forest and wildland resources.
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.)	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.
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	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)	Protects 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)	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)	Lists fur-bearing mammals which require a permit for take.
Fully Protected Species (Fish and Game Code Sections 3511,4700, 5050, and 5515)	Identifies several amphibian, reptile, fish, bird and mammal species which are Fully Protected. The California Department of Fish and Wildlife (CDFW) cannot issue a take permit), except for take related to scientific research.
California Environmental Quality Act (CEQA Guidelines, CCR, Title 14, Section 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.

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
Oak Woodlands (California PRC Section 21083.4)	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.)	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 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)	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 California Department of Food and Agriculture 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	
Regional Habitat Conservation Plans (HCP) and Natural Communities Conservation Plan (NCCP)	HCPs and NCCPs establish a coordinated process for permitting and mitigating the incidental take of endangered species and conserving natural resources. Approved HCPs and NCCPs potentially relevant to proposed Advanced Clean Cars (ACC) Program include, but are not limited to, the Western Riverside County HCP; Lower Colorado River Multi-Species Conservation Plan; Coachella Valley Multi-Species HCP; Orange County Central/Coastal NCCP/HCP; Kern Water Bank HCP; Southeastern Lincoln County, Nevada HCP; and the Mojave and Colorado Desert regions and Solano Multispecies Habitat Conservation Plan.
Various City and County General Plans	General plans typically designate areas for land usages, guiding where new growth and development should occur

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
	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.

4.0 CULTURAL RESOURCES

A. Existing Conditions

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 California's past. Traditional or ethnographic cultural resources include Native American sacred sites (traditional cultural properties), traditional cultural places, 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 (California PRCPRC Section21084.1; 14 California Code of Regulations [CCR] Section15064.5(a)).

Paleontological resources include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains that are more than 5,000 years old and occur mainly in Pleistocene or older sedimentary rock units.

1. Cultural Resource Setting

a) Prehistoric Overview

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 2007b).

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 2007b). 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 2007a). 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 2007b). 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; Chartkoff and Chartkoff 1984; Jones and Klar 2007a). 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 2007b), 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 1978a, 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 1978a, 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 1978b).

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: pp. 662-669). 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 1978b). 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 (OPR 2005). Although acknowledged as non-federally recognized California Native American tribes on the contact list maintained by the Native American Heritage Commission (NAHC), many groups continue to await federal tribal status recognition. As of 2005, there were 109 federally recognized tribes within the state, along with dozens of non-federally recognized tribes. 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 (Caltrans 2008). In 1850, California became the 31st state, largely as a result of the Gold Rush.

2. Paleontological Setting

a) Statewide Overview

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 Table 6). 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 6: 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	
	Jurassic	200	

Table 6: Divisions of Geologic Time			
Era	**Period**	**Time in Millions of Years Ago (approximately)**	**Epoch**
	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.

B. Regulatory Setting

Table 7: Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
Federal	
NHPA of 1966	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 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	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." Foray major federal actions significantly affecting environmental quality, federal agencies must prepare, and make available for public comment, an environmental impact statement.
Archaeological Resources Protection Act of 1979 (NRPA)(16 USC 470aa-470II)	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)	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

Table 7: Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
	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)	Establishes procedures for compliance with Section 106 of the National Historic Preservation Act of 1966. These regulations define the Criteria of Adverse Effect, define the role of State Historic Preservation Officer (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) 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.
National Park Service Regulations, National Register of Historic Places (NRHP) (36 CFR 60)	Sets 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 (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 U.S. 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 Highway Administration (FHA), Federal Transit 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.

Table 7: Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
	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.
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).
Local	
City/County General	Policies, goals, and implementation measures in county or city

Table 7: Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
Plans	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, 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 (PA) requiring permits (California Public Utilities Commission [CPUC], BLM) to complete archaeological investigations and employ the Secretary of Interior's Professional Qualification Standards and Guidelines (36 CFR 61).

5.0 ENERGY DEMAND

A. Existing Conditions

The major energy sources consumed in the United States are petroleum (oil), natural gas, coal, nuclear, and renewable energy. The major users are residential and commercial buildings, industry, transportation, and electric power generators. The pattern of fuel use varies widely by sector. For example, oil provides 93 percent of the energy used for transportation, but only about 1 percent of the energy used to generate electric power (U.S. EIA 2013a).

Excluding Federal offshore areas, California ranks third in the Nation in crude oil production and refining capacity in 2011. California ranks third in the Nation in conventional hydroelectric generation, first in net electricity generation from other renewable energy resources, and first as a producer of electricity from geothermal

energy (in 2011). In 2010, California, with two nuclear power plants, ranked tenth in net electricity generation from nuclear power plants and eighth in nuclear net summer capacity. Average site electricity consumption in California homes is among the lowest in the nation (6.9 megawatt hours per year), according to EIA's Residential Energy Consumption Survey. In 2010, California's per capita energy consumption ranked 48th in the Nation, due in part to its mild climate and energy efficiency programs (EIA 2013b).

In 2010, California's in-state electricity generation sources consisted of: 53.4 percent natural gas, 15.7 percent nuclear, 14.6 percent large hydropower, 14.6 renewable sources, and 1.7 percent from coal. Approximately 71 percent of total electricity generation was from in-state sources, with the remaining electricity coming from out-of-state imports from the Pacific Northwest (8 percent) and the Southwest (21 percent). (CEC 2011a)

On the demand side, in 2010, Californians consumed 272,300 gigawatt hours (GWh) of electricity and 12,700 million therms of natural gas, primarily in the commercial, residential, and industrial sectors. A California Energy Commission (CEC) staff forecast of future energy demand shows that electricity consumption will grow by between 1.18 and 1.68 percent per year between 2012 and 2022; and natural gas consumption is expected to reach up to 14,175 million therms by 2022 for an annual average growth rate of up to 0.94 percent (CEC 2011b).

The 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 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.

B. Regulatory Setting

Table 8: Applicable Laws and Regulations for Energy Demand	
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 U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United

Table 8: Applicable Laws and Regulations for Energy Demand	
Regulation	**Description**
	States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. 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 U.S. The Corporate Average Fuel Economy (CAFE) program, administered by the US EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The US EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test 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	The Warren-Alquist Act is the legislation that created and gives statutory authority to the California Energy Commission (formally called the State Energy Resources Conservation and Development Commission).

Table 8: Applicable Laws and Regulations for Energy Demand	
Regulation	**Description**
of 1974	
Integrated Energy Policy Reports (SB 1389)	Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the California Energy Commission 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 (Pub. Resources Code, § 25301,subd. (a)). The Energy Commission prepares these assessments and associated policy recommendations every two 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 stakeholders in an extensive public process to identify critical energy issues and develop strategies to address those issues (CEC 2012a).
California Long-Term Energy Efficiency Strategic Plan	On Sept. 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 (CCR Title 24, Part 6)	California's Building Energy Efficiency Standards (Title 24, Part 6 of the California Code of Regulations) conserve electricity and natural gas in new building construction and are administered by the CEC. Local governments enforce the standards through local building permitting and inspections. The CEC has updated these standards on a periodic basis. The new 2013 Building Energy Efficiency Standards, which take effect on January 1, 2014, are 25 percent more efficient than previous standards for residential construction and 30 percent more efficient for nonresidential construction.
Comprehensive Energy Efficiency Plan for Existing Buildings (AB 758)	Assembly Bill 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	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

Table 8: Applicable Laws and Regulations for Energy Demand	
Regulation	**Description**
(RPS) (SB X1-2)	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 (MW) of CHP for entities under the jurisdiction of the CPUC, although this target includes not just new CHP, but capacity from renewal of contracts due to expire in the next three 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 Appliance Efficiency Regulations (CCR, Title 20)	California's Appliance Efficiency Regulations, enacted in 1976, requires that certain appliances meet efficiency standards. Each appliance must be tested and the results certified by the CEC in order for a product can be sold in California (CEC 2012b).
Alternative and Renewable Fuel and Vehicle Technology Program	Assembly Bill 118 (Statues of 2007) created the California Energy Commission's Alternative and Renewable Fuel and Vehicle Technology Program. The statute, subsequently amended by Assembly Bill 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.

6.0 GEOLOGY AND SOILS

A. Existing Conditions

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 (USGS 1995). The average annual precipitation across all California climate types is approximately 23 inches and approximately 75 percent of the State's annual precipitation falls between November and March, primarily in the form of rain,

with the exception of high mountain elevations (DWR 2003). Average annual precipitation ranges from more than 100 inches in the mountainous areas within the Smith River in Del Norte County to less 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.

1. 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 (Harden 1997). Tectonics and climate also have a large effect on the occurrence natural environmental hazards, such as earthquakes, landslides, and volcanic formations.

a) 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).

b) 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 U.S. 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.

c) 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.

d) 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.

e) 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 the1972 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.

B. Regulatory Setting

Table 9: Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
Federal	
Safe Drinking Water Act - Federal Underground Injection Control Class VI Program for Carbon Dioxide Geology Sequestration Wells	Under the Safe Drinking Water Act (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 EPA Region in order 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 United States 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.
CWA	This law was enacted to restore and maintain the chemical, physical, and biological integrity of the nation's waters by regulating point and nonpoint pollution sources, providing assistance to 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 a Storm Water Pollution Prevention Plan (SWPPP). In California, the State's NPDES permit program is implemented and administered by the local Regional Water Quality Control Boards.
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.
State	
Seismic Hazards Mapping Act, PRC Section 2690–2699.	The Seismic Hazards Mapping Act (the Act) of 1990 (PRC, Chapter 7.8, Division 2) directs the California DOC, Division of Mines and Geology (now called California Geological Survey

Table 9: Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
	[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.
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 regulate drilling, production, injection, and gas storage operations in accordance with CCR Title 14, 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) (CCR Title 24)	California's minimum standards for structural design and construction are given in the CBSC (CCR Title 24). The CBSC is based on the Uniform Building Code (International Code Council 1997), which is used widely throughout 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.
California Department of Transportation (Caltrans) Seismic	Caltrans has SDC, which is an encyclopedia of new and currently practiced seismic design and analysis methodologies for the design of new bridges in California. The SDC adopts a performance-based approach specifying minimum levels of

Table 9: Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
Design Criteria (SDC)	structural system performance, component performance, analysis, and design practices for ordinary standard bridges. The SDC has been developed with input from the Caltrans Offices of Structure Design, Earthquake Engineering and Design Support, and Materials and Foundations. Memo 20-1 outlines the bridge category and classification, seismic performance criteria, seismic design philosophy and approach, seismic demands and capacities on structural components and seismic design practices that collectively make up Caltrans' seismic design methodology.
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 (BMPs) similar to those contained in a SWPPP.
County General Plans (and EIR)	Some county General Plans provide a regulatory framework to address potential environmental impacts that may result from a proposed project. These include the General Plans for Solano, San Luis Obispo, Los Angeles, Kern, San Bernardino, Riverside, and Imperial counties.

7.0 GREENHOUSE GASES

A. Existing Conditions

1. Existing Climate

Climate is the accumulation of daily and seasonal weather events over a long period of time, whereas weather is defined as the condition of the atmosphere at any particular time and place (Ahrens 2003). Like its topography, California's climate is varied and tends toward extremes. Generally there are two seasons in California: 1) a long, dry summer, with low humidity and cool evenings and 2) a mild, rainy winter, except in the high mountains, where four seasons prevail and snow lasts from November to April. The one climatic constant for the state is summer drought.

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 U.S. For example, differences between average summer and winter temperatures between San Francisco and Monterey for example are seldom more than 10°F (6°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 U.S. 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 in (5 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 US, 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 mph (18 km/hr). Tropical rainstorms occur often in California during the winter.

2. 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 (WMO) and by the United Nations Environment Programme (UNEP), 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 greenhouse gas (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 Kyoto Protocol took effect in 2004, after 55 parties to the Convention had ratified it (The UN Climate Change Convention and the Kyoto Protocol). Six major GHGs have been the focus of efforts to reduce emissions and are included in AB 32: carbon dioxide (CO_2),methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (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. Importantly, metrics such as GWP have been used as an exchange rate in multi-gas emissions policies and frameworks. Each gas's GWP is defined relative to CO_2. For example, N_2O's GWP is 310, meaning a unit mass of N_2O warms the atmosphere 310 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).

3. 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, 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. CH_4, a potent GHG, resulting primarily from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions), is largely associated with fugitive emissions from oil and gas operations, natural gas transmission, agricultural practices, and landfills. N_2O is also largely attributable to agricultural practices nitrogen-based fertilizers) and soil management. CO_2 sinks, or reservoirs, include vegetation, soils, and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration.

California is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006). California produced 484 million gross metric tons of CO_2e in 2004 (ARB 2009). CO_2 equivalent (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 2009), 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 34 tons of CO_2 (IPCC 2013). Therefore, CH_4 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. The current inventory covers years 2000 to 2011 (available at http://www.arb.ca.gov/cc/inventory/data/data.htm).

California's gross emissions of greenhouse gases decreased by 6 percent from 478.4 million metric tons of CO_2e ($MMTCO_2e$) in 2001 to 448.1 $MMTCO_2e$ in 2011, with a maximum of 489.2 $MMTCO_2e$ in 2004. During the same period, California's population grew by 9 percent from 34.5 to 37.6 million people1. As a result, California's per capita GHG emissions have decreased over the last 11 years from 13.9 to 11.9 metric tons of CO_2e per person. In 2011, emissions continued to decrease for the transportation and electric power sectors. Emissions from all other sectors (e.g., industrial,) remained relatively flat or increased slightly from 2010.

4. 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 tropospheric ozone, methane, 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. ARB is currently pursuing additional actions to further reduce SLCP emissions. These include targeting research on SLCP emissions from various sources to help the State identify

specific cost-effective measures, and developing regulations where cost-effective techniques are clearer.

a) 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 volatile organic compound (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 State Implementation Plans (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.

b) Methane

CH_4 is a potent and short-lived GHG. It is the second most prevalent GHG emitted in the United States from human activities. In addition to its climate forcing properties, methane also has a number of 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 man-made 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).

c) Hydrofluorocarbons

HFCs are synthetic gases that are the fastest growing climate forcers in the United States 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 (ODS) in refrigeration, air conditioning, insulating foams, solvents, aerosol products, and fire protection.

d) 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 (locomotives, marine vessels, tractors, excavators, dozers, etc.), on-road vehicles (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 ARB 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 ARB'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.

5. Adaptation to Climate Change

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3–7°F by the end of the century, depending on future GHG emission scenarios (IPCC 2007). 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

both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state (including the project site).

According to the California Energy Commission (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. Currently, the State is developing its second adaptation strategy, acknowledging the steady progress made since the first one in 2009 and recognizing the enormous challenges ahead. The strategy will need to be updated periodically in the future. The many adaptation planning efforts underway in virtually every State agency, in local communities such as Chula Vista, San Diego, Los Angeles, Santa Barbara, Santa Cruz, San Francisco, Hayward, Marin County, 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).

B. Regulatory Setting

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

Table 10: Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Federal	
Mandatory Greenhouse Gas Reporting Rule	On September 22, 2009, US 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 US EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publically 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	On September 15, 2009, US EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce GHG emissions and improve fuel efficiency for all new cars and trucks sold in the United States. US EPA proposed the first-ever national GHG emissions standards under the CAA, and NHTSA proposed CAFE standards under the Energy Policy and Conservation Act. This proposed national program would allow automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both Federal programs and the standards of California and other states. The President requested that US EPA and NHTSA, on behalf of the Department of Transportation, develop, through notice and comment rulemaking, a coordinated National Program under the CAA and the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act (EISA), to reduce fuel consumption by and GHG emissions of light-duty vehicles for model years 2017-

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	2025. US EPA and NHTSA are developing the proposal based on extensive technical analyses, an examination of the factors required under the respective statutes and on discussions with individual motor vehicle manufacturers and other stakeholders. The National Program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles (light-duty vehicles) built in those model years (76 FR 48758). The first part of this program (i.e., 2012-2016) is implemented. The next part (i.e., 2017-2025) is currently in process for which ARB is proposed to accept compliance thereof as also being acceptable for California compliance, similar to what was done for the first part.
Endangerment and Cause or Contribute Findings	On December 7, 2009, US 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 US 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., carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [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, higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	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. US 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 US EPA to finalize the GHG standards proposed earlier in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.
State	
Executive Order S-3-05	Executive Order 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 Executive Order established total greenhouse gas emission 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 Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The 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 Executive Order, the Secretary of the Cal/EPA 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.
Assembly Bill 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

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from substantial stationary and mobile source categories. Requires ARB to produce a Scoping Plan by 1/1/2009 and at least every five years afterwards that details how the State will meet its GHG reduction targets. AB 32 requires that ARB 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.
Assembly Bill 1493, Statutes of 2002	In September 2004, ARB 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.
Executive Order S-1-07	Executive Order 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 ARB to determine if this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early action measure after meeting the mandates in AB 32. The Board approved the LCFS on April 23, 2009.
Senate Bill 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 greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.
Senate Bill 1078, Statutes of 2002, Senate Bill 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.
Senate Bill 97, Statutes of 2007	As directed by SB 97, the Natural Resources Agency adopted Amendments to the CEQA Guidelines for greenhouse gas 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.
Senate Bill 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 Transportation Plan (RTP). ARB, 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. ARB 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 (RNHA) 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 incentivize qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."
Executive Order S-13-08	Sea level rise is a foreseeable indirect environmental impact associated with climate change, largely attributable to thermal

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	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 Executive Order S-13-08 on November 14, 2008. This executive order 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 executive order 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. Executive Order 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.

8.0 HAZARDS AND HAZARDOUS MATERIALS

A. Existing Conditions

California Health and Safety Code (Section 25501) defines "hazardous materials" as any material 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 are grouped into four categories based on their characteristics: 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 is finished with its intended use and is discarded. 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.

B. Regulatory Setting

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials

Regulations	Description
Federal	
CAA (42 USC Section 9601 et seq.)	The CAA is the law that defines US EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The last major change in the law, the CAA Amendments of 1990, was enacted by Congress in 1990. Legislation passed since then has made several minor changes. The CAA like other laws enacted by Congress, was incorporated into the United States Code as Title 42, Chapter 85. The House of Representatives maintains a current version of the U.S. Code, which includes Clean Air Act changes enacted since 1990.
CWA (40CFR 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 United States. Section 402 of the CWA specifically required US EPA to develop and implement the NPDES program.
Safe Drinking Water Act (SDWA)	SDWA is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, US EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
	amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA does not regulate private wells which serve fewer than 25 individuals.
Federal Underground Injection Control Class VI Program for Carbon Dioxide Geology Sequestration Wells	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 EPA Region in order 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 United States 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.
Federal Hazardous Materials Regulations (FHMR) Title 49, Code of Federal Regulations, 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 US 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 specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon and lead-based paint.
Resource Conservation and Recovery Act (RCRA) 42 U.S.C. Section 6901 et seq. Title 40, CFR	RCRA of 1976 gives US 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 US 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

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
	the other mandates of this law include increased enforcement authority for US EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program. Federal regulations adopted by US 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).
Emergency Planning and Community Right-to-Know Act (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 (SERCs/TERCs), responsible for coordinating certain emergency response activities and for appointing local emergency planning committees (LEPCs).
State	
Various California Air Pollution Control Laws (i.e., Bluebook)	Includes all relevant Health and Safety Code sections of law, plus those air pollution- related statutes from other California codes, and the CCR Titles 13 & 17 sections that pertain to ARB's air management program.
Hazardous Materials Transportation California Vehicle Code Sections 31301-31309	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

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
	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 California Health & Safety Code, Division 20, Chapter 6.5 CCR, Division 4.5, Title 22	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 CCR, Title 19, 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.
Hazardous Material Business Plan & Area Plan Program Health and Safety Code Sections 25500 – 25520 CCR, Title 19, 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. Certified Unified Program Agencies (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.

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
Unified Program Administration Health and Safety Code, Chapter 6.11, Sections 25404-25404.8 CCR, Title 27, 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 6 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.
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.

9.0 HYDROLOGY AND WATER QUALITY

A. Existing Conditions

1. 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 U.S., 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 1998). The State has more than sixty 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.

2. 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, the majority 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.

3. 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 (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 the US EPA and SWRCB through 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).

B. Regulatory Setting

Table 12: 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.
Executive Order 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 U.S. Environmental Protection Agency (US EPA). Pertains to water quality standards, state responsibilities, and discharges of waste to waters of the United States. 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 (TMDL) 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 requirements may include multiple measures to control pollutants in stormwater discharge. During implementation of specific projects, applicants

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	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 U.S., including wetlands, and administered by the U.S. Army Corps of Engineers.
National Toxics Rule and California Toxics Rule	Applicable receiving water quality criteria promulgated by US EPA for priority toxic pollutants consisting generally of trace metals, synthetic organic compounds, and pesticides.
State	
California Water Rights	The State Water Resources Control Board (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 (Title 23)	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. Regional Water Boards issue waste discharge requirements for discharge activities to water and land, require monitoring and maintain reporting programs, and implement enforcement and compliance policies and procedures. Other state agencies with jurisdiction in water

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	quality regulation in California include the Department of Public Health (drinking water regulations), Department of Pesticide Regulation, Department of Toxic Substances Control, CDFW, and the Office of Environmental Health and Hazard Assessment.
Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California	Commonly referred to as the State Implementation Policy (or 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 one 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 discharge limitations and prohibitions similar to those in the General Construction Permit.

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
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 types of industrial sites based on the Standard Industrial Classification. The general industrial permit requires the preparation of a SWPPP that identifies potential onsite pollutants, BMPs to be implemented, and inspection/monitoring.
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).

10.0 LAND USE AND PLANNING

A. Existing Conditions

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.

B. Regulatory Setting

Table 13: 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 right-of-ways 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

Table 13: Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
	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.
State	
State Planning and Zoning Law	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.
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.).

Table 13: Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
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.
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.
Housing Element Law	State law requires each city and county to adopt a general plan containing at least seven mandatory elements including housing. Unlike the other general plan elements, the housing element, required to be updated every five to six years, is subject to detailed statutory requirements and mandatory review by a State agency, the California Department of Housing and Community Development (Department). Housing elements have been mandatory portions of local general plans since 1969. This reflects the statutory recognition that housing is a matter of statewide importance and cooperation between government and the private sector is critical to attainment of the State's housing goals. The availability of an adequate supply of housing affordable to workers, families, and seniors is critical to the State's long-term economic competitiveness and the quality of life for all Californians.

11.0 MINERAL RESOURCES

A. Existing Conditions

The CGS classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act of 1975 and assists the CGS 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 the 7th state in the U.S. 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).

B. Regulatory Setting

Table 14: Applicable Laws and Regulations for Mineral Resources

Regulation	Description
Federal	
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	
Surface Mining and Reclamation Act (SMARA)	The intent of SMARA of 1975 is 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

Table 14: Applicable Laws and Regulations for Mineral Resources	
Regulation	**Description**
	deposits. Local jurisdictions are given the authority to permit or restrict mining operations, adhering to the SMARA legislation. Classification of an area using Mineral Resource Zones (MRZ) 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.
CBSC (CCR Title 24)	California's minimum standards for structural design and construction are given in the CBSC (CCR Title 24). The CBSC is based on the Uniform Building Code (International Code Council 1997), which is used widely throughout 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.
Local	
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 BMPs similar to those contained in a SWPPP.
County General Plans (and EIR)	Some county General Plans provide a regulatory framework to address potential environmental impacts that may result from a proposed project

12.0 NOISE

A. Existing Conditions

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 are presented in Table 15.

Table 15: 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	--
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 2009: p.2-21

1. 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 decibel (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 summed. 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 (i.e., transportation) such as automobiles, trucks, and airplanes and stationary sources (i.e., non-transportation) 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 (i.e., decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers. 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 (i.e., 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 (e.g., berms, hills, and dense vegetation) and human-made features (e.g., 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 30–40 dB with its windows closed (Paul S. Veneklasen & Associates 1973, cited in Caltrans 2002: p. 7-37).

2. Common 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 2009).

Equivalent Noise Level (L_{eq}): The equivalent steady-state noise level in a stated period of time that would contain the same acoustic energy as the time-varying noise level during the same period (i.e., average noise level).

Maximum Noise Level (L_{max}): The highest instantaneous noise level during a specified time period.

Minimum Noise Level (L_{min}): The lowest instantaneous noise level during a specified time period.

Day-Night Noise Level (L_{dn}): The 24-hour L_{eq} with a 10-dB penalty applied during the noise-sensitive hours from 10 p.m. to 7 a.m., which are typically reserved for sleeping.

Community Noise Equivalent Level (CNEL): Similar to the L_{dn} described above with an additional 5-dB penalty applied during the noise-sensitive hours from 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.

3. 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: p. 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 2009).

4. 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 (FTA 2006, Caltrans 2004). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006). This is based on a reference value of 1micro (μ) 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 are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration is rarely perceptible. The range of interest is 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. Construction activities could generate groundborne vibrations that potentially pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (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 16 describes the general human response to different levels of groundborne vibration-velocity levels.

Table 16: 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 μ inch/second and based on the root mean square (RMS) velocity amplitude. Source: FTA 2006: p. 7-8	

5. Sensitive Land Uses

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, schools, 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. These types of receptors 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.

B. Regulatory Setting

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
Federal	
Federal Noise Control Act (1972) US 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. US 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

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
	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 to produce and disseminate educational materials to the public on the harmful effects of noise and ways to effectively control it.
24 CFR, Part 51B (U.S. Department of Housing and Urban Development [HUD])	This regulation established standards for HUD-assisted projects and actions, requirements, and guidelines on noise abatement and control.
Federal Aviation Administration (FAA) Order 1050.1D	This order contains policies and procedures for considering environmental impacts.
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	This regulation established a standard for noise exposure in the workplace.

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
(U.S. Department of Labor Occupational Safety and Health Administration [OSHA])	
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 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.
Section 5000 et seq. (CCR, Title 21, Division 2.5, Chapter 6), California Airport Noise Regulations promulgated in accordance with the State Aeronautics Act	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.
California Streets and Highways Code Section 216 (Freeway Noise in Classrooms)	This section, known as the Control of Freeway Noise in School Classrooms, requires that, in general, Caltrans abate noise from freeways to specified levels when the noise exceeds specified levels in school classrooms

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
California Government Code Section 65302 (Provision of Noise Contour Maps)	This section requires Caltrans to provide cities and counties with noise contour maps along State highways.
Title 24, Part 2, California Code of Regulations	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 Ldn levels to 45 dBA in any habitable room.

13.0 EMPLOYMENT, POPULATION, AND HOUSING

A. Existing Conditions

1. Population

Population trends and growth projections are useful measures to help predict and plan for future State recreational facility needs. According to the California Department of Finance 2010 Census data, the population of California in 2010 was approximately 37,253,956 (DOF 2010). 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 (CSP 2005). It is expected that the population of California will reach and surpass the 50-million mark sometime between 2030 and 2040 if the current growth rates persist (CSP 2005).

2. Housing

As population within the State increases, housing distribution and household conditions are expected to evolve. Existing housing units, households, and vacancy rates for the State of California are shown below in Table 18. Data was derived from the California Department of Finance 2010 Census (DOF 2010).

Table 18: 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: DOF 2010	

B. Regulatory Setting

Federal and state laws do not control population and employment. See housing-related regulations in Section J, Land Use and Planning.

14.0 PUBLIC SERVICES

A. Existing Conditions

1. Law Enforcement

US EPA is charged with protecting human health and the environment, by writing and enforcing regulations based on laws passed by Congress. The Environmental Protection Agency's Criminal Investigation Division 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.

Enforcement of environmental laws in California is the responsibility of the Attorney General's Office and the CalEPA. 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. In regards to 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: legally defending the State's clean cars law against multiple challenges, filing numerous actions against the Bush Administration regarding regulation of global warming pollution, 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 (DOJ 2011).

CalEPA was created in 1991 by Governor's Executive Order. 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: ARB, Department of Pesticide Regulation, Department of Toxic Substances Control, Office of Environmental Health Hazard Assessment, and State Water Resources Control Board (including the nine Regional Water Quality Control Boards).

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: ARB (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: Department of Toxic Substances Control (part of CalEPA) and CUPA.
- Carcinogens/Reproductive Toxins: Prop. 65 through the Office of Environmental Health Hazard Assessment (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.

2. Fire Protection and Emergency Medical Response Services

The United States Forest Service is an agency of the United States Department of Agriculture that administers the nation's 155 national forests and 20 national grasslands, which encompass 193 million acres (780,000 km^2), 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 the US Forest Service 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 our Federal, State, and International fire partners.

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.

3. Schools

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

B. Regulatory Setting

Table 19: 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.

15.0 RECREATION

A. Existing Conditions

Recreational resources and facilities are provided and managed at federal, state, and local levels. The federal government manages a diverse array of recreation facilities and resources in California that 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. USFWS manages the wildlife and fisheries resources and their habitats. Each federal agency's programs include recreation components

California has over 275 State beaches and parks, recreation areas, wildlife areas, historic parks, and museums, and has authority over fishing and hunting activities, habitat restoration and protection in the State. General plans for State parks, recreation areas, and beaches are publicly available. 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 have involvement in recreational

activities include Boating and Waterways, Fish and Wildlife, Tahoe Regional Planning Association, various conservancies, and others (California State Parks 2008).

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.

B. Regulatory Setting

Table 20: 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.
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.

16.0 TRANSPORTATION AND TRAFFIC

A. Existing Conditions

Existing roadway systems in the project area generally consist of highways, freeways, arterials, local streets, and intersections/ramps. The existing average annual daily traffic (AADT) 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 (V/C) 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).

B. Regulatory Setting

Table 21: 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	
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.

17.0 UTILITIES AND SERVICE SYSTEMS

A. Existing Conditions

1. Water Supply and Distribution

The principal water supply facilities in California are operated by the United Stated Bureau of Reclamation (USBR) and DWR. The USBR is a federal agency and it is the

largest wholesaler of water in the U.S. and the second largest producer of hydroelectric power (USBR 2011a). 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 2011b).

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 2010).

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).

2. 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 regional water quality control boards (RWQCB) are responsible for development and enforcement of water quality objectives and implementation plans that protect the beneficial uses of the federal and State waters (SWRCB 2013). The State water board 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.

3. 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.

4. Solid Waste Collection and Disposal

Statewide, the California Department of Resources Recycling and Recovery (CAL Recycle), 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.

B. Regulatory Setting

Table 22: Applicable Laws and Regulations for Utilities

Regulation	Description
Federal	None applicable
State	
Waste Heat and Carbon Emissions Reduction Act of 2007	The Waste Heat and Carbon Emissions Reduction Act of 2007 (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

Table 22: Applicable Laws and Regulations for Utilities	
Regulation	**Description**
	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.
CPUC, Section 95-08-038	This section contains the rules for planning and construction of new transmission facilities, distribution facilities, and substations. The CPUC requires permits for the construction of certain power line facilities or substations if the voltages would exceed certain thresholds.
Section 21151.9 of the PRC/ Section 10910 et seq. of the Water Code	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.

ATTACHMENT 3: PRIOR ENVIRONMENTAL ANALYSIS

1.0 TRANSPORTATION SECTOR

A. 2008 Scoping Plan Overview

The initial Scoping Plan addressed the transportation sector as the largest contributor to GHG emissions in the State, including transportation fuels, land use, infrastructure, and travel activity. In 2011, transportation activities contributed 38 percent of the GHG emissions in California. The initial Scoping Plan contained three overarching GHG emission reduction strategies for this sector: more efficient vehicles, lower-carbon fuels, and reduction of vehicle use or vehicle miles traveled (VMT).

California's GHG emission reduction efforts on transportation began in 2002 when the Legislature passed AB 1493 (Pavley, Chapter 200, Statues of 2002), the Pavley bill. ARB approved regulations to implement the Pavley bill in 2004. Specific GHG emission reduction measures for the transportation sector included reducing GHG emissions from cars, reducing the carbon content of fuels, a reduction of vehicle use or VMT, and inclusion of transportation fuels in the Cap-and-Trade regulation. To date, regulations are in place to achieve 23 million metric tons (MMT) of GHG emission reductions in 2020. Reductions have been largely, but not exclusively, focused on light-duty vehicles, and are being achieved through a three-pronged approach: 1. Regulations, 2. Incentives, and 3. Transportation, land use, and housing planning.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the transportation sector measures is provided in Table 1. More details about measures that have been implemented since 2008 and a summary of their associated environmental analyses, follow this table.

Table 1 Summary of Transportation Sector Environmental Impacts in the 2008 FED

Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(T-1) Pavley I and II – Light –Duty Vehicle Greenhouse Gas Standards[2] (*January 2012)*	No adverse environmental impacts anticipated.	None necessary.
(T-2) Low Carbon Fuel Standard – includes	**Aesthetics** – This measure is undergoing	Any impacts would be assessed on a location and project- specific

[2]Measure T-1 in the initial Scoping Plan was referred to as "Pavley I and II – Light –Duty Vehicle Greenhouse Gas Standards." The new title for the measure as discussed in the Update, Advanced Clean Cars, builds upon the Pavley I and II GHG emission standards. See the discussion of Advanced Clean Cars below.

Table 1 Summary of Transportation Sector Environmental Impacts in the 2008 FED		
Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
facilities for ethanol and biodiesel production; use of hydrogen and electricity as alternative fuels. *(April 2009, early action item)*	regulatory development.	basis.
	Air Quality - Ethanol production requires the use of thermal and electrical power. Process steam production is the primary source of criteria pollutant emissions. The largest sources of PM_{10} are associated with grain handling, and the largest sources of VOCs are associated with the fermentation, distillation, storage, and loading of the ethanol produced.	Procure VOC emissions offsets. Employ best available control technologies which may include Ultra-Low NO_X burners on steam boilers, baghouses for PM control, and wet scrubbers to control VOC emissions. Site facilities near truck or rail terminals, consider proximity to feedstocks or users of ethanol products to minimize transport emissions.
	Hydrogen can be a low-carbon fuel. Can be used in either modified internal combustion engines or in fuel cells. Combusting hydrogen produces heat, water, and may produce minor NO_X emissions.	Should be quantified and measures to mitigate identified in regulatory process.
	Agricultural Resources - Siting of new stationary sources, such as ethanol facilities, or facilities that convert biomass to fuel may convert prime farmland to other uses – the degree of which would be determined locally, and may conflict with an existing Williamson Act contract.	Avoid siting on prime agricultural lands, lands under Williamson Act contract, support of the California Farmland Conservancy Program. Such facilities would require a local approval of conditional use permits, local air permits, and other permits and would be subject project-specific compliance with CEQA.
	Biological Resources –	Project-specific CEQA

Table 1 Summary of Transportation Sector Environmental Impacts in the 2008 FED		
Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	When converting natural lands, there may be adverse impacts to terrestrial, riparian or aquatic habitat, natural communities or to an species identified as a candidate, sensitive or special status species in local or regional plans, policies or regulations or by the California Department of Fish and Game (CDFW), the US Fish and Wildlife Service (USFWS) or ins 404 of the Clean Water Act. Interference with movement in corridors. **Cultural Resources –** Future facilities in California may involve siting, grading, construction or expansion on lands that have not been surveyed for cultural significance, and may result in adverse impacts to cultural resources if inadvertent disturbance occurs during construction. **Energy Demand** - Future ethanol production facilities in California will likely use natural gas to produce steam and purchase required	compliance will be necessary. Project-specific CEQA compliance will be necessary. Project-specific compliance with CEQA and/or NEPA would be required. The lead and implementing agencies would be required to contact the appropriate agencies and departments to ensure that potential impacts to cultural resources would be minimized or avoided. Employ efficiency and control technologies at existing facilities. Recycle, reuse or reprocess wastes. Wastes that cannot be recycled, reused or reprocessed must be disposed of appropriately.

Table 1 Summary of Transportation Sector Environmental Impacts in the 2008 FED		
Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	electricity from a utility.	
	Hazards and Hazardous Materials – Some of the pathways may generate waste that may contain hazardous materials	Check with County to ensure conformity with Contract, file for nonrenewal if nonconforming.
	Land Use and Planning – Conversion of crops from food and fiber to fuel crops may conflict with Williamson Act contract.	Should be discussed and analyzed in the LCFS regulatory development process.
	Water Resources Water Quality – chemicals and fertilizers used on crops can end up in surface or ground waters, affecting water quality. There may be potential adverse impact to water quality from formulation of low-carbon fuels in the event of spills.	Employment of appropriate spill prevention and spill abatement protocols.
(T-3) Regional Transportation-Related Greenhouse Gas Reduction Targets	**Land Use Policies** - May conflict with existing land use policies in some regions of the State.	Any land use policy conflicts will be resolved at regional and local levels in a collaborative process.
Congestion Pricing, Indirect Source Rule, Education and outreach efforts, and Pay as You Drive Insurance support to this measure	Congestion Pricing – May increase vehicle use on off-hours but would result in no net increase in emissions.	Separate environmental evaluation needed.
	Indirect Source Rule for	Separate evaluation needed to

Table 1 Summary of Transportation Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(Targets Approved September 2010. Major urban regions have adopted SCSs that meet, and in some cases exceed, the targets)	New Development – requires separate environmental evaluation. Education – no adverse impacts anticipated. Pay as You Drive – Dept. of Insurance is pursuing.	adopt regulations. None necessary.
(T-4) Vehicle Efficiency Measures (tire inflation, use of low friction oils, cool paints)	No adverse environmental impacts anticipated, but further analysis will be completed to verify.	None necessary.
(T-5) Ship Electrification at Ports *(December 2006,early action item)*	**Air Quality** – Indirect impacts from criteria pollutant emissions associated with incremental electricity generation at power plants. **Energy Demand** - May increase energy demand.	These emissions are significantly less than emissions generated by ship engines. Environmental evaluation completed as part of regulation. Employ off-peak charging
(T-6) Goods Movement Port trucks, drayage *(December 2006,early action item)*	Analyzed in separate FED.	
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Vessel Speed Reduction (VSR) – exploring the requirement to reduce speed Cleaner ships – Design and fuel efficiency strategies Commercial Harbor Craft – voluntary action to use alternative anti-fouling	No adverse environmental impact anticipated, but will need additional analysis. Analyzed in 2007 SIP FED. **Hazards and Hazardous Materials** - Anti-fouling agents to	Conceptual at this time, not quantified. No additional analysis necessary. Adopted. Encourage non-toxic anti-fouling

Table 1 Summary of Transportation Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
agent	improve hull smoothness may contain copper. This measure encourages the use of alternative agents with no copper. Disposal of residual copper-containing agents may have an adverse impact.	product use and education of owners/operators on the toxicity of copper to reduce use and improper disposal of these chemicals.
Cargo handling	No adverse environmental impact anticipated, but additional analysis will verify.	May require further analysis.
Transport Refrigeration Units (TRU) *(Sub-measures 2–7 and others are being considered in the development of the 2014 Sustainable Freight Strategy)*	**Energy Demand** -TRUs may increase energy demand by electrification.	Employ off-peak charging to balance electrical load.
(T-7) Heavy Duty Vehicle Greenhouse Gas Emission Reduction – Aerodynamic Efficiency *(December 2008, early action item; anticipated late 2013)*	Regulation and associated impacts are currently being evaluated in separate EA, scheduled for Board hearing and adoption in December 2013.	
(T-8) Medium and Heavy-Duty Vehicle Hybridization *(April 2009, early action item)*	No adverse impacts anticipated with efficiency measures, however some technologies are in research and development phase. Further evaluation will verify.	None necessary at this time.
(T-9) High Speed Rail	Impact analysis incorporated by	Programmatic EIR/EIS was prepared in 2001, followed by

Table 1 Summary of Transportation Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	Reference into 2008 FED, SCH# 2001042045, Potential and cumulative impacts include aesthetics, displacement of commercial and residential properties, disproportionate impacts to minority and low-income populations, community and neighborhood disruption, increased noise and electromagnetic interference along rail corridors, land use policies, traffic impacts associated with stations, effects to historic properties or archaeological sites, impacts to parks and recreation resources, exposure to seismic and flood hazards, water resources, wetlands and sensitive biological species and habitat, land use compatibility, energy use and impacts to agricultural resources.	project environmental documents. Mitigation measures incorporated by reference into the 2008 FED.

After adoption of the initial Scoping Plan, the following programs were developed and implemented in furtherance of the measures identified above in Table 1. As part of adoption of these programs, potential environmental impacts were analyzed and disclosed, and mitigation measures were recommended, as appropriate, as summarized below.

1. Advanced Clean Cars

The Advanced Clean Car (ACC) Program, approved in 2012, builds upon the Pavley I and II GHG emission standards, and combines three programs to control smog-forming, particulate matter, toxic air contaminant (TAC), and GHG emissions in a single coordinated package of requirements for model years 2015 through 2025. One goal of the regulations is to promote the development of environmentally superior cars that will continue to deliver the performance, utility, and safety vehicle owners have come to expect.

The ACC Program involved amendments to existing regulations for Low-Emission Vehicles (LEV III), Zero-emission Vehicles (ZEV), and Clean Fuels Outlets (CFO). To achieve further criteria emission reductions from the passenger vehicle fleet, several amendments were adopted to represent a significant strengthening of the existing LEV program. The LEV amendments included improvements to consumer labeling, patterned on California's revolutionary environmental performance label (EPL), to provide important emissions information in a graphical, easy-to-understand format. The ZEV program focused on vehicle technology development by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in the 2018-2025 model years. The amendments to the CFO regulation were designed to assure ultra-clean fuels, such as hydrogen, are available to meet vehicle demands resulting from the projected increase in number of ZEVs operating in the State.

The environmental analysis prepared for the ACC Program was based on the expected compliance responses of the regulated communities covered by the ACC (ARB 2011a) The environmental analysis concluded that the compliance responses to the ACC would result in beneficial impacts to air quality through reductions in emissions, including greenhouse gases, CAPs, and TACs. It further concluded that the proposed ACC would result in less-than-significant impacts to agricultural and forest resources, land use, minerals, noise, population and housing, public services and recreation. The environmental analysis concluded there could be potentially significant adverse impacts to aesthetics, air quality (related to construction), biological resources, cultural resources, geology/soils, hazards (related to accidental releases), hydrology/water quality, traffic and utilities, largely due to construction activities related to the CFO regulation (ARB 2011a). The ACC regulations were adopted by the Board in March 2012 but the CFO regulation was never finalized.

In September 2013, ARB released proposed amendments to the ZEV regulation that would adjust the optional Section 177 state compliance path provision, define how caps apply to a manufacturer's requirements, and disallows battery swapping to qualify under the fast refueling definition for Type IV and V ZEVs. The environmental analysis, included in Chapter 4 of the ISOR prepared for the amendments and released for a 45-day comment period, concluded that implementing the proposed amendments to the ZEV regulation would not result in any potentially significant adverse impacts on the environment.

2. Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS), developed in 2009 and effective in 2010, is designed to reduce the GHG emissions from California's consumption of transportation fuels by providing a durable framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011. The standards are "back-loaded," meaning there are more reductions required in the last five years than the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. ARB anticipates that compliance with the LCFS will be based on a combination of strategies involving lower carbon fuels and more efficient, advanced-technology vehicles.

Reformulated gasoline mixed with corn-derived ethanol at 10 percent by volume and low sulfur diesel fuels represent the baseline fuels. The LCFS does not ban the production, import or use of any individual fuel—regardless of carbon intensity—but the regulation's aggregate carbon intensity standard serves to incentivize the use of lower-carbon alternatives to gasoline and conventional diesel. For example, lower carbon fuels may be lower-carbon ethanol, biodiesel, renewable diesel, natural gas, biomethane, hydrogen, or electricity. The LCFS's flexible framework also encourages the development of completely new fuels with lower carbon intensities.

As noted in the environmental analysis prepared for the LCFS program, the program is anticipated to provide beneficial environmental impacts associated with air quality and annual reductions of 15 MMT of GHG emissions by 2020 (ARB 2009a).

In October of 2011, ARB released proposed amendments to the LCFS regulation. The environmental analysis, included in Chapter 5 of the ISOR prepared for the amendments and circulated for a 45-day comment period, concluded the proposed amendments to the LCFS regulation would not result in any potentially significant adverse impacts on the environment. Those amendments were finalized in October of 2012, became effective November 26, 2012, and were implemented on January 1, 2013.

The LCFS has been the subject of three lawsuits against ARB. Most recently, in the state court lawsuit filed by Poet LLC in December 2009 that involves CEQA and other claims, the Fifth District Court of Appeal issued an opinion in July 2013 that allows the LCFS standards to remain operative while ARB takes corrective action directed by the court for compliance with CEQA and the APA.

3. Regional Transportation-Related Greenhouse Gas Target

Senate Bill (SB) 375 aligns regional land use, transportation, housing, and GHG emission reduction planning efforts. SB 375 requires ARB to set regional GHG emission

reduction targets for passenger vehicles and light trucks for 2020 and 2035. (Gov. Code, § 65080, subd. (b)(2)(A).) The targets are for the 18 metropolitan planning organizations (MPOs) in California. The MPOs must develop a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plans (RTPs) to demonstrate how they will achieve the targets, if it is feasible to do so. If it is not feasible for the MPO to achieve its target through an SCS, then the MPO must prepare an Alternative Planning Strategy (APS) which is independent of the RTP.

Targets for each of the MPOs were approved by ARB in September 2010. Major urban regions have adopted SCSs that meet, and in some cases exceed, the targets. SB 375 requires CEQA Compliance for MPOs adopting SCSs. At the time of release of the Plan Update, SCSs had been adopted by the San Diego Association of Governments, Southern California Association of Governments, Sacramento Area Council of Governments, Tahoe Metropolitan Planning Organization/Tahoe Regional Planning Agency, Butte County Association of Governments, Santa Barbara County Association of Government, and the Association of Bay Area Governments / Metropolitan Transportation Commission.

According to the environmental analysis prepared by ARB when setting the targets pursuant to SB 375, impacts associated with SCSs would generally be beneficial and provide: increased mobility, economic benefits, reduced air and water pollution, conservation of open space, farmland, and forest land, healthier, more equitable and sustainable communities. Significant adverse environmental impacts were described for air quality, traffic congestion, population growth, displacement of residents, utilities and services, noise, light and glare, and aesthetic/visual impacts. Mitigation measures were described that could reduce these impacts. MPOs are required to prepare their own specific Environmental Impact Reports (EIR) for SCSs and/or RTP updates, pursuant to CEQA and determine project-level impacts and develop appropriate mitigation measures, as feasible (ARB 2010a).

4. Regulation for Under Inflated Vehicle Tires

The regulation for Under Inflated Vehicle Tires, adopted in September 2010, applies to automotive service providers (ASPs) performing or offering to perform automotive maintenance or repair services in California. Staff estimated there are approximately 40,000 ASPs in California that are subject to this regulation. Except for under limited circumstances, it requires ASPs to perform a tire pressure service (check and inflate) on all passenger vehicles that are brought in to the facilities for service or repair. This includes passenger cars, light duty trucks, medium duty vehicles, and light heavy duty trucks with gross vehicle weight ratings (GVWR or GVR) of less than or equal to 10,000 pounds. These requirements apply to ASPs that perform engine maintenance, smog checks or routine service such as oil changes on any passenger vehicle. Examples of ASPs that are not affected include automotive car washes, body and paint facilities, and glass repair.

As noted in the Initial Statement of Reasons for the Regulation for Under Inflated Vehicle Tires, ARB concluded that implementation of this regulation would result in GHG emission reductions and would not result in any significant adverse public health or environmental impacts (ARB 2009b).

5. Heavy Duty Vehicle GHG Emission Reduction

The initial Scoping Plan included a measure for Phase 1 of the regulation. Proposed Phase I regulatory language that amended several existing regulations was released for public review and comment on October 23, 2013. The Board approved the proposed regulations in December 2013. The Phase 1 GHG regulations establish GHG emission standards and test procedures for medium- and heavy-duty engines and vehicles with gross vehicle weight rating (GVWR) over 8,500 pounds, and phase in between model years (MY) 2014 and 2018.

California's Phase I GHG regulation harmonizes with the Phase I GHG emission standards already adopted by the U.S. Environmental Protection Agency (US EPA) in 2011, providing California with the ability to certify engines and vehicles to these standards and enforce the requirements in California. As described in the environmental analysis in the Staff Report prepared for this regulation, no adverse impacts result from implementation of this regulation.

6. High-Speed Rail

The purpose of the proposed High Speed Rail (HSR) system is to provide a reliable mode of travel, which links the major metropolitan areas of the state and delivers predictable and consistent travel times. Further objectives are to provide an interface with commercial airports, mass transit, and the highway network and to relieve capacity constraints of the existing transportation system as intercity travel demand in California increases, in a manner sensitive to and protective of California's unique natural resources. The system needs to be practicable and feasible as well as economically viable. The system should maximize the use of existing transportation corridors and rights-of-way, be implemented in phases, and be completed by 2020.

As noted in the Program EIR/EIS for the California High-Speed Train System, developed in 2004 by the California High-Speed Rail Authority, HSR would have potentially significant environmental impacts, including effects on noise, biology, wetlands, and farmlands. It would have beneficial impacts to energy savings, reduced air pollutant emissions, and improved intercity travel conditions. The overall HSR program was adopted in November 2005. The Merced-to-Fresno section of the program was approved in May 2012 under CEQA, and September 2012 under NEPA. Project-level planning and environmental analysis of individual sections is on-going (California High-Speed Rail Authority 2013). The HSR Project has been the subject of lawsuits that have challenged the Program EIR/EIS and subsequent CEQA documents. The most recent case, *Town of Atherton et al v. California High Speed Rail Authority*, is pending in the California Court of Appeal, Third District, as of the time of this EA.

2.0 ENERGY SECTOR (ELECTRICITY AND NATURAL GAS)

A. 2008 Scoping Plan Overview

California's Energy Sector includes a complex system of production, transmission and distribution, and end uses of electricity and natural gas. Presently, about 40 percent of the State's total GHG emissions are associated with the Energy Sector, therefore, efforts to reduce energy-related emissions are a key component of the Scoping Plan.

The initial Scoping Plan envisioned achieving the majority of the GHG emission reductions for the Energy Sector from four key programs: building and appliance energy efficiency standards; the 33 percent Renewable Portfolio Standard (RPS); the Million Solar Roofs program; and the Cap-and-Trade Regulation. The initial Scoping Plan also included transportation-related programs that affect energy-sector emissions, such as port electrification requirements and increased penetration of electric vehicles. The status of these programs was discussed in the previous section. The Energy Sector was tasked with achieving 25 MMT of GHG emission reductions by 2020, with almost half of the reductions from energy efficiency programs.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the Energy Sector measures is provided in Table 2. More details about measures that have been implemented since 2008, and a summary of their associated environmental analyses, follow this table.

Table 2 Summary of Energy Sector Environmental Impacts in the 2008 FED

Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(E-1 and CR-1) Energy Efficiency *(2013 Building standards adopted and begin implementation January 1, 2014; CEC adopted and implemented standards for battery chargers and television sets. New standards for*	**Hazards and Hazardous Materials**- Efficiency Standards may occasionally result in the use of new or new versions of products that contain hazardous materials and require special recycling or disposal.	Compliance with applicable hazardous materials recycling and disposal laws. Disposal of hazardous waste would occur at an appropriated permitted disposal facility.

Table 2 Summary of Energy Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
other appliances are currently under development.; Utility Energy Efficiency Programs are being implemented)		
(E-2) Increasing Combined Heat and Power *(AB1613, enacted in 2007, being implemented. CPUC adopted standard contracts for CHP systems and set targets for CHP procurement)*	**Air Quality** –No adverse air quality impacts are anticipated, unless individual CHP units are installed in a way that is not conforming to the measure design.	Use of best available control technology (BACT). These units are permitted through the Air Districts. Location and project-specific CEQA analysis may be required.
(E-3) Renewables Portfolio Standard *(SBx1 2, enacted in 2011, being implemented by CPUC, CEC, and publically owned utilities)*	**Aesthetics** - siting and construction of wind or solar farms that would support the expansion of the Renewables Portfolio Standard (RPS) may affect viewsheds. **Agricultural Resources** - Siting of new utility scale facilities and arrays may convert prime farmland to other uses – the degree of which would be determined locally, and may conflict with an existing Williamson Act contract.	Careful design and siting of these facilities will avoid impacts, consistent with available CEC and Department of Fish and Game (DFG) guidance documents and siting requirements of federal agencies. Project- specific analysis would be necessary. Avoid siting on prime agricultural lands, lands under Williamson Act contract. If unavoidable, support of the California Farmland Conservancy Program. Such facilities would require a local approval of conditional use permits, and other permits and would be subject project- specific compliance with CEQA.

Table 2 Summary of Energy Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	Air Quality – Biomass facilities siting and operations may cause an increase in nitrogen oxide, sulfur dioxide, particulate matter (PM_{10} and $PM_{2.5}$).	Use of BACT, such as catalytic converters and filtration. Location and project specific impact analysis will be necessary.
	Biological Resources - Any utility scale facility may require a relatively large area if it is to be used to generate electricity at a commercial scale, and large arrays of solar collector may interfere with natural sunlight, rainfall, drainage which could have a variety of impacts on plants and animals. Solar arrays may also create avian perching opportunities that could affect both bird and prey populations. A wind farm may present a potential risk to migrating birds if the facility is sited in a migratory flyway.	Location-specific impact analysis will be necessary. Careful design and siting of wind farms, turbines and infrastructure would minimize the risk for bird strikes. Advances in turbine and wind farm design have resulted in fewer, more powerful turbines and better protection for birds. Use of guidelines by CEC and DFG.
	A solar thermal plant requires around 50 times more land than combined cycle natural gas fueled power plant per megawatt (MW). Construction activities associate with solar thermal plants disturb the land, and fencing can interfere with wildlife corridors.	Specific impacts depend on biological characteristics of the land being developed. Sensitive populations and habitat should be avoided.
	Nitrogen dioxide deposition from cooling towers at solar thermal plants and new geothermal projects degrade vegetation.	Use of BACT. Provision of habitat compensation, revegetation.
	Cultural Resources – Future facilities in California may involve	Project-specific compliance with CEQA and/or NEPA would be

Table 2 Summary of Energy Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	siting, grading, construction or expansion on lands that have not been surveyed for cultural significance, and may result in adverse impacts to cultural resources if inadvertent disturbance occurs during construction.	required. The lead and implementing agencies would be required to contact the appropriate agencies and departments to ensure that potential impacts to cultural resources would be minimized or avoided.
	Hazards and Hazardous Materials – Municipal solid waste may contain hazardous materials, which could result in solid and gaseous hazardous by-products.	Ash can be recycled or shipped to landfills permitted to accept such waste, and hazardous materials should be diverted prior to combustion.
	Land Use and Planning – Siting of new utility scale facilities and arrays may conflict with an existing Williamson Act contract, or lands under easement. Conversion of crops from food and fiber to fuel crops may conflict with existing Williamson Act contract.	Avoidance would be most appropriate mitigation. If land is under easement, conditions must allow use. Such facilities would require a local approval of conditional use permits, and other permits and would be subject project- specific compliance with CEQA.
	It is foreseeable that additional transmission infrastructure will be necessary to help support the RPS requirements to deliver renewable power to consumers.	Check with County to ensure consistency with Contract.
	Noise – Powerplants and wind power installations may increase ambient noise levels.	Siting of transmission facilities is subject to project specific CEQA analysis by the CPUC.
	Recreation (see Aesthetics)	General Plan Noise Elements and ordinances identify appropriate local noise levels and accepted mitigation measures such as

Table 2 Summary of Energy Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
		mufflers, limited hours of operations and installation of sound barriers. USDI Bureau of Land Management is preparing an environmental impact statement (Federal Register/ Vol. 73, No. 104, Notices, May 29, 2008) that precludes (as mitigation) the siting of solar arrays from lands within the National Landscape Conservation System, such as National Conservation Areas, National Monuments, Wilderness Areas, Wilderness Study Areas, Wild and Scenic Rivers and National Historic and Scenic Trails, and lands that have been identified as environmentally sensitive.
(E-4) Million Solar Roofs *(Greater than 1,400 MW installed to date*)	**Aesthetics** - Roof top solar panels and solar water heaters may adversely affect a neighbor's quality of rooftop views, however, this is a subjective value. These measures may limit where trees may be planted in order to preserve solar access. **Hazards and Hazardous Materials** – Solar panels may leak if mishandled and broken. Photovoltaic panels may contain hazardous materials, and although they are sealed under normal operating conditions, there is the potential for environmental contamination if they were damaged or improperly	The significance to aesthetic values would be location specific. Proper handling and operation and good maintenance practices can be used to minimize impacts from hazardous materials (Federal Register/ Vol. 73, No. 104, Notices, May 29, 2008).

Table 2 Summary of Energy Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	disposed upon decommissioning. Concentrating solar power system may employ liquids such as oils or molten salts that may be hazardous and present spill risks. Various fluids commonly used in most industrial facilities, such as hydraulic fluids, coolants, and lubricants and may present a spill related risk.	

After adoption of the initial Scoping Plan, the following proposed program in the electricity sector was developed by ARB in furtherance of the measures identified above in Table 2. As part of preliminary adoption of this proposal, potential environmental impacts were analyzed and disclosed, and mitigation measures were recommended, as appropriate as summarized below.

1. Renewable Electricity Standard

The Renewable Electricity Standard (RES) was developed for the purpose of reducing emissions of GHGs in California. The RES advanced the standard for the proportion of electricity generation by eligible renewable sources from 20 percent, as established in 2002 by the California RPS, to 33 percent.

In 2010, ARB prepared an EA to assess the potential environmental impacts of a regulation proposed to implement the 33 percent standard. The EA and regulation, however, were never finalized because the Legislature passed, and the Governor signed, SBX1-2 (the California Renewable Energy Resources Act) in 2011. SBX1-2, being implemented by the California Public Utilities Commission, the California Energy Commission, and publically owned utilities, obligates all California electricity providers to obtain at least 33 percent of their energy from renewable resources by the year 2020.

3.0 WATER SECTOR

A. 2008 Scoping Plan Overview

For purposes of the initial Scoping Plan, the water sector includes groundwater and surface water resources and the infrastructure for its storage, conveyance, use, treatment, and recycling from these sources. The storage, conveyance and treatment of water in California consume large amounts of electricity. Approximately 19 percent of

the electricity and 30 percent of non-power plant natural gas consumption is used by the water sector to grow crops, support urban and industrial needs, and produce energy. Therefore, most of the water measures included in the initial Scoping Plan focused on the GHG emission benefits derived from reduced energy use, and the emission benefits are reflected in those sectors.

California's 2009 Water Conservation Act (Senate Bill X7-7) specifically addresses urban and agricultural water conservation. The Act's key urban provision established an aggressive statewide goal to reduce per capita water use by 20 percent by 2020. To date, 400 urban water agencies have prepared water management plans, which cover close to 80 percent of California's population.

The State has also set ambitious goals for development of alternative water sources such as recycled water and storm water. Grant and loan programs have provided over $1.15 billion for recycling and storm water capture infrastructure, and projects are coming online.

In addition, the State has invested $1.5 billion to support 48 regional collaborative efforts to develop water management plans, diversify regional water portfolios, and increase regional water supply self-reliance to support future growth and development. Governor Brown has also taken action to reduce water use consumption by directing State agencies and departments to reduce their overall water use by 10 percent by 2015 and 20 percent by 2020.[3]

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the water sector measures is provided in Table 3.

Table 3 Summary of Water Sector Environmental Impacts in the 2008 FED

Measure *(Status/Consideration Date)*	Potential Adverse Environmental Impacts	Potential Mitigation Measures
(W-1) Water Use Efficiency *(State agencies are reducing water usage)*	Ongoing program administered by various state agencies.	None necessary.
(W-2) Water Recycling *(State Water Resources Control Board (SWRCB) is funding recycled water development projects)*	**Air Quality** - Installation of water recycling infrastructure would require construction activities, potentially generating typical short-term construction impacts such as dust generation,	Local jurisdictions and Air Pollution Control Districts typically require measures to mitigate construction impacts such as preparation of grading plans, dust minimization, minimizing idling of equipment and restriction of hours of

[3] See Executive Order B-18-12, issued on April 25, 2012.

Table 3 Summary of Water Sector Environmental Impacts in the 2008 FED		
Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	equipment emissions and objectionable odors.	operation.
	Biological Resources – Water recycling has the potential to reduce wastewater discharges, potentially modifying downstream environments and potentially impacting protected habitats and /or species. Project implementation has the potential to adversely impact biological resources located on project sites, along pipeline corridors and in proximity to construction zones.	Site specific field survey and mitigation may be warranted, and project-level CEQA compliance would be accomplished by appropriate lead agencies as individual projects are considered.
	Cultural Resources – Future facilities in California may involve siting, grading, construction or expansion on lands that have not been surveyed for cultural significance, and may result in adverse impacts to cultural resources if inadvertent disturbance occurs during construction.	Project-specific compliance with CEQA and/or NEPA would be required. The lead and implementing agencies would be required to contact the appropriate agencies and departments to ensure that potential impacts to cultural resources would be minimized or avoided.
	Energy Demand – Water recycling could increase the amount of energy used at local wastewater treatment facilities.	Wherever possible, water recycling would be performed during off-peak periods.
	Land Use and Planning	Site specific, project-level CEQA

Table 3 Summary of Water Sector Environmental Impacts in the 2008 FED		
Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	– Projects may conflict with habitat conservation plan or natural community conservation plan. **Population and Housing** – The availability of recycled water may represent an additional water supply that may foster community growth. **Water Resources/Water Quality** – Water recycling reduces the quantity of water entering into downstream flows, water table recharge, and infiltration. If wastewater is relied upon for dilution, this reduction could contribute to higher concentrations of contaminants in downstream waters and/or in water tables.	compliance would be accomplished by appropriate lead agencies. Availability of water supply created by recycling may be considered during General Plan updates and development proposals. Project-level CEQA evaluation would be necessary. This additional water supply is not considered an adverse impact. All water recycling facilities must be permitted and operated in accordance with the requirements of the Water Boards and the Department of Public Health. Project level CEQA compliance would be accomplished by appropriate lead agencies on a project-level basis. Project-specific analysis would be necessary. Project-specific compliance with CEQA and/or NEPA would be required. The lead and implementing agencies would be required to contact the appropriate agencies and departments to ensure that potential impacts to cultural resources would be minimized or avoided.
(W-3) Water System Energy Efficiency	**Agricultural, Biological Resources** - New support	Similar mitigations to W-2. Project-specific evaluations

Table 3 Summary of Water Sector Environmental Impacts in the 2008 FED		
Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(CEC has adopted standards for water efficiency. *CPUC has ordered IOUs to invest in energy and water efficiency)*	facilities may convert or disturb agricultural or natural lands. **Cultural Resources** – Future facilities in California may involve siting, grading, construction or expansion on lands that have not been surveyed for cultural significance, and may result in adverse impacts to cultural resources if inadvertent disturbance occurs during construction.	would be necessary and CEQA compliance would be performed by the appropriate lead agencies. Project-specific analysis would be necessary. Project-specific compliance with CEQA and/or NEPA would be required. The lead and implementing agencies would be required to contact the appropriate agencies and departments to ensure that potential impacts to cultural resources would be minimized or avoided.
(W-4) Reuse Urban Runoff *(SWRCB is funding numerous storm water reuse projects)*	**Air Quality** – Construction of water capture and storage facilities would produce short-term construction impacts. **Biological Resources** – Construction has the potential to impact sensitive species that exist on project sites. **Cultural Resources** – Future facilities in California may involve siting, grading, construction or expansion on lands that have not been surveyed for cultural significance, and may result in adverse impacts to cultural resources if	Project-specific analysis would be necessary for new facilities. Compliance with Authority to Construct permit. Project-specific analysis necessary. Project-specific compliance with CEQA and/or NEPA would be required. The lead and implementing agencies would be required to contact the appropriate agencies and departments to ensure that potential impacts to cultural resources would be minimized or avoided.

Table 3 Summary of Water Sector Environmental Impacts in the 2008 FED		
Measure *(Status/Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
	inadvertent disturbance occurs during construction.	
(W-5) Increase Renewable Energy Production *(DWR is contracting from renewable energy projects. The CEC is researching biogas technologies.)*	**Agricultural Resources** – New support facilities may convert or disturb agricultural lands. **Air Quality** – Construction of new facilities would produce short term construction impacts. **Biological Resources** – Construction has the potential to impact sensitive species that exist on project sites. **Cultural Resources** – Future facilities in California may involve siting, grading, construction or expansion on lands that have not been surveyed for cultural significance, and may result in adverse impacts to cultural resources if inadvertent disturbance occurs during construction.	None necessary.
(W-6) Public Goods Charge for Water *(The program has been evaluated but is not being implemented at this time.)*	No direct adverse environmental impacts are anticipated, as this measure is a potential funding source.	

4.0 GREEN BUILDINGS

A. 2008 Scoping Plan Overview

Buildings represent the second largest source of statewide GHG emissions when accounting for electricity, natural gas, and water consumption during ongoing operations and maintenance. Additional GHG emissions also result from the mining, harvesting, processing, and transportation of materials used to construct new buildings, as well as products consumed over the life of a building. The siting and integration of buildings into communities may affect transportation patterns and infrastructure needs and result in varying GHG emission impacts. Residential energy retrofits are also an important avenue for increasing energy efficiency and reducing GHG emissions. As the largest construction industry sector, residential construction affords the greatest potential for maximizing the benefits of green technologies. Emission reductions from green buildings are reflected in the electricity and natural gas sectors.

To address the impacts of GHG emissions from buildings, the initial Scoping Plan included a Green Building Strategy to expand the use of green building practices and reduce the carbon footprint of California's buildings. The initial Scoping Plan acknowledged that the design and construction of new green buildings, as well as the sustainable maintenance, operation, and renovation of existing buildings, would result in significant GHG emission reductions.

The initial Scoping Plan identified a single Green Building measure, "GB-1," with a broad description of potential actions or strategies by building type, including greening new and existing State buildings, public schools, residential housing, and commercial buildings. Since 2008, the Green Building measure has been implemented under four key programs and initiatives; the State Green Building Initiative (Executive Order B-18-12), California Green Building Standards (CALGreen) Code, Beyond Code, and Existing Building Retrofits, which collectively form the basis for the strategy.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with Green Buildings is provided in Table 4.

Table 4 Summary of Green Buildings Environmental Impacts in the 2008 FED

Green Buildings *(Status/ Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(GB-1) Green Buildings (Also includes Greening Public Schools, New Residential and Commercial Construction, and Existing Homes and Commercial Buildings)	No adverse environmental impacts anticipated, further analysis would verify	None necessary.

(Green Buildings Executive Order B-8-12, signed April 2012. California Building Standards Commission adopted the 2010 CALGreen codes. 2013 CALGreen codes become effective January 2014. Over 100 local governments have adopting green building standards that are more stringent than State standards. CEC is implementing AB 758.)		

5.0 INDUSTRY SECTOR

A. 2008 Scoping Plan Overview

The Industry sector covers a broad and diverse range of sources, including cement plants, refineries, power plants, glass manufacturers, and oil and gas production facilities. Industrial sources play a significant role in the State's vast economy and accounted for about 21 percent of California's total GHG emissions in 2011. These GHG emissions result primarily from stationary source combustion processes, such as boilers and furnaces. The initial Scoping Plan identified the Cap-and-Trade Program, and the use of innovative technology and ideas to meet the requirements placed on the industrial sector.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the industry sector measures is provided in Table 5. More details about measures that have been implemented since 2008, and a summary of their associated environmental analyses, follow this table.

Table 5 Summary of Industry Sector Environmental Impacts in the 2008 FED

Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(I-1) Energy Efficiency and Co-Benefits Audits for Large Industrial Sources *(July 2010)*	Audits would have no adverse impacts at this time; however, results of audit will determine whether any further actions are necessary.	None necessary.
(I-2) Oil and Gas Extraction GHG Emissions Reduction – Best Management Practices and technologies to reduce	No adverse environmental impact anticipated, but additional analysis will verify.	Separate environmental evaluation will be conducted during regulatory development.

Table 5 Summary of Industry Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
fugitive emissions from venting and leaks from wells, process equipment, separation and storage. Increase compressor capacity Remove existing regulatory fugitive methane exemptions *(Expected 2014)*		
(I-3) GHG Leak Reduction from Oil and Gas Transmission- Best Management Practices and technologies to reduce fugitive emissions from venting and leaks along natural gas pipelines practices *(under evaluation)*	No adverse environmental impact anticipated, but additional analysis will verify.	Separate environmental evaluation will be conducted during regulatory development.
(I-4) Refinery Flare Recovery System Improvement *(Equivalent measure implemented by local air districts)*	No adverse environmental impact anticipated, but additional analysis will verify.	Separate environmental evaluation will be conducted during regulatory development.
(I-5) Removal of Methane Exemption from Existing Refinery Regulations *(Under evaluation in collaboration with local air districts)*	No adverse environmental impact anticipated, but additional analysis will verify.	Separate environmental evaluation will be conducted during regulatory development.

After adoption of the initial Scoping Plan, the following programs were developed and implemented in furtherance of the measures identified above in Table 5. As part of adoption of these programs, potential environmental impacts were analyzed and disclosed, and mitigation measures were recommended, as appropriate.

1. Energy Efficiency and Co-Benefits Audits for Large Industrial Sources

The initial Scoping Plan included a measure that would require California's largest industrial facilities to conduct a one-time assessment of the facility's fuel and energy consumption and emissions of GHGs, CAPs, and TACs. The assessments were to include the identification of potential energy efficiency improvement projects. ARB approved the energy efficiency assessment regulation in 2010 and subsequently received assessment reports from 43 industrial facilities covering five industrial sectors: refinery, cement, hydrogen production, power generation, and oil and gas/mineral production. These are facilities that are covered entities under the Cap-and-Trade Program. The first of the Public Reports was posted on June 6, 2013 and the second on August 26, 2013. Links to the reports are available at: http://www.arb.ca.gov/cc/energyaudits/energyaudits.htm . After the release of all the Public Reports, ARB will develop preliminary findings and recommendations for all of the sectors. ARB will use these findings to identify the best approaches to secure energy efficiency improvements and the associated emission reductions at California's largest facilities (ARB 2013a).

2. Oil and Gas Extraction GHG Emission Reduction

The initial Scoping Plan proposed the development of a measure to reduce venting and fugitive GHG emissions associated with oil and gas production. These emissions come from various sources, such as compressor seals, storage tanks, and leaking components such as valves, flanges, and connectors. The results of a survey conducted by ARB of the oil and gas industry were released in 2011, and ARB staff released a new test procedure for determining emissions from oil and natural gas separation and storage systems in 2012 (ARB 2013b).

3. GHG Emissions Reduction from Natural Gas Transmission and Distribution

In 2009, ARB conducted a survey of emissions from commercial, residential, and industrial natural gas transmission and distribution pipelines. This survey assessed fugitive GHG emissions from these pipelines based upon material types including: plastic, copper, caste iron, protect steel, and unprotected steel. In addition, other pipeline components were assessed, such as household and commercial meters, metering and regulation stations, and compressors (ARB 2009b).

6.0 CAP-AND-TRADE REGULATION

A. 2008 Scoping Plan Overview

The initial Scoping Plan recommended the development of a California Cap-and-Trade Regulation that links with other Western Climate Initiative partner programs to create a regional market system. On January 1, 2013, ARB launched the second-largest GHG Cap-and-Trade Program in the world. The Cap-and-Trade Regulation ensures progress toward the near-term 2020 statewide limit, while providing businesses the greatest flexibility to reduce emissions at the lowest possible cost.

The Cap-and-Trade Program is a vital component in achieving both California's near- and long-term GHG emissions targets. California's Cap-and-Trade Regulation is purposely designed to leverage the power of the market in pursuit of an environmental goal. It opens the door for major investment in emission-reducing technologies and sends a clear economic signal that these investments will be rewarded. The Cap-and-Trade Regulation establishes a hard and declining cap on approximately 85 percent of total statewide GHG emissions. Under the Cap-and-Trade Regulation, ARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. One allowance equals one metric ton of greenhouse gases. Each regulated entity must hold allowances or other compliance instruments equal to its emissions.

The Cap-and-Trade Regulation is being implemented in two stages. Electric generating utilities, electricity importers, and large industrial facilities became subject to the program beginning in 2013, and fuel distributors are brought under the cap in 2015.

Under the Cap-and-Trade Regulation, a portion of the allowances required for compliance are auctioned by the State. The first auction of emission allowances occurred in November 2012. To date, ARB has held six successful auctions.

ARB is considering several amendments to improve the Cap-and-Trade Regulation. In particular, ARB proposes to provide additional transition assistance in the form of free allowances to industrial producers while the new leakage studies are being conducted. In addition, ARB is proposing mechanisms to keep allowance prices within an acceptable range by allowing a limited number of future allowances to be used for compliance should prices get too high. California linked its program with the Canadian Province of Québec in January 2014. California and Québec have worked together to harmonize their regulations and coordinate on a joint auction platform and tracking system. ARB provided a report on the status of linkage implementation to the governor and Cal/EPA in November 2013.

As part of the Cap-and-Trade Regulation, the Board also approved an Adaptive Management Plan to monitor for unintended consequences of the Cap-and-Trade Regulation. The Plan requires ARB to develop systems to monitor for and respond to: (1) potential adverse localized air quality impacts that might be caused by the Cap-

and-Trade Regulation, and (2) potential adverse impacts that might be caused by the Compliance Offset Protocol U.S. Forest Projects (Protocol). ARB is working with the local air districts to determine the most effective path forward for gathering and evaluating permit data, GHG data, and other information needed for monitoring for potential localized impacts. As part of this effort, ARB staff has proposed amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions to collect information on GHG emission increases and decreases from covered entities. ARB has contracted with the University of California, Davis, and is working with forestry experts from around the country to develop a proposed monitoring approach to understand potential forest impacts resulting from implementation of the Protocol under Cap-and- Trade.

B. Summary of Prior Environmental Impact Analysis

In 2010, ARB prepared an environmental analysis, entitled the *Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms* (2010 Cap-and-Trade FED), to analyze the environmental impacts associated with the proposed Cap-and-Trade Regulation and the four proposed compliance offset protocols. The FED concluded that the compliance responses to the proposed Regulation would result in beneficial impacts to air quality through reductions in emissions, including GHGs, CAPs and TACs, in addition to beneficial impacts to energy demand. It further concluded that the Regulation would result in less than significant impacts, or no impacts, to aesthetics, agricultural and forest resources, hazards, land use, noise, employment, population and housing, public services, recreation, transportation and traffic, and utilities/service systems. The FED concluded there could be potentially significant adverse impacts to biological resources, cultural resources, geology/soils and minerals, and hydrology/water quality largely due to construction activities for projects to reduce GHG emissions. Although the potential for adverse impacts caused by implementation of projects under Forest Offset Protocol and adverse localized air quality impacts were found to be unlikely, the FED conservatively considered them potentially significant. The Board approved an Adaptive Management Plan as an integral part of the program to monitor and address any unanticipated and unintended adverse impacts to localized air quality or biological resources from the Cap-and-Trade Regulation (see description above). The final Regulation was adopted in October 2011 and became effective on January 1, 2012 (ARB 2011b).

In 2012, ARB proposed two sets of amendments to the Cap-and-Trade Regulation. The first set of amendments, related to program implementation, was approved by the Board in June 2012. The second set of amendments, related to jurisdictional linkage with Québec, was approved by the Board in April 2013. An environmental analysis (2012 Cap-and-Trade EA) prepared for these amendments was included in Chapter IV of the Staff Report: Initial Statement of Reasons entitled *Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms to Allow for the Use of Compliance Instruments Issued by Linked Jurisdictions (*ARB 2012a).

The 2012 Cap-and-Trade EA concluded that the amendments to clarify the Cap-and-Trade Regulation to help ARB implement, oversee, and enforce the Regulation would not change what was already required or the methods of compliance by covered entities evaluated in the 2010 FED (i.e., upgrade equipment, decarbonize, implement process changes, and surrender compliance instruments), and therefore the potential for environmental impacts fell within the scope and scale of those already analyzed. The analysis also considered the potential for indirect environmental impacts resulting from California-covered entities acquiring offset credits from projects in Québec because implementation of the linkage amendments could result in California entities acquiring credits from offset projects under Québec's Digesters (i.e., livestock), ODS, and Landfill Gas Offset Protocols. The EA relied on the prior EA conducted for California's ODS and Livestock Offset Protocols and ARB's Landfills Regulation because Québec's protocols are substantially similar. Those prior EAs concluded that implementation of these types of offset projects would result in beneficial impacts to GHG emissions and no adverse impacts, or less-than-significant impacts, in all resource areas, except implementation of the Livestock Protocol has the potential for significant adverse impacts to odors, cultural resources, noise, and transportation/traffic. The analysis referenced recognized mitigation measures for these impacts and determined that these impacts can be avoided or reduced to a less-than-significant level. However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, in this case Québec agencies, and there is inherent uncertainty in the degree of mitigation ultimately implemented, the analysis took a conservative approach in its post-mitigation significance conclusions finding that impacts to odors, cultural resources, and transportation/traffic in Québec may remain significant after mitigation.

The Board approved written responses to comments on the 2012 Cap-and-Trade EA and adopted findings for the significant adverse impacts. The written response to comments for the first set of amendments are included in the FSOR released in July 2012 (ARB 2012b) and for the linkage amendments in the FSOR released May 2013 (ARB 2013c). These documents can be found on the Cap-and-Trade Regulation website, http://www.arb.ca.gov/regact/2012/capandtrade12/capandtrade12.htm.

In 2013, ARB prepared an EA for the proposed regulatory amendments released in September 2013. The 2013 Cap-and-Trade EA supplements the 2010 Cap-and-Trade FED and was included in Chapter 3 of the Initial Statement of Reasons (ISOR) prepared for the proposed regulatory amendments. It was released for a 45-day comment period from September 9, 2013 to October 24, 2013. The 2013 analysis concluded that the proposed regulatory amendments to the Cap-and-Trade Regulation would not result in any new significant adverse impacts or an increase in the severity of any significant impacts on the environment as previously identified in the 2010 Cap-and-Trade FED and may provide air emissions benefits as compared to current practices. An environmental analysis for the proposed addition of a new Compliance Offset Protocol for Mine Methane Capture (MMC Protocol) was included in the separate Staff Report prepared for the proposed protocol, included as Appendix A to the ISOR prepared for the proposed 2013 regulatory amendments. ARB staff determined that implementation

of MMC projects would result in no adverse impacts to greenhouse gas emissions and public services. Less-than-significant impacts were identified for aesthetics, agriculture and forest resources, air quality, energy demand, geology, soils, and minerals, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, population and housing, recreation, transportation and traffic, and utilities and service systems. Impacts to biological resources and cultural resources were determined to be potentially significant related to landscape disturbance required for construction of facilities and infrastructure. This regulatory proposal is still under development and will be considered for approval by the Board at a public hearing in the spring of 2014.

7.0 RECYCLING AND WASTE MANAGEMENT SECTOR

A. 2008 Scoping Plan Overview

The Recycling and Waste Management Sector covers all aspects of solid waste and materials management, including landfills (recycling, reuse, and remanufacturing of recovered material), composting (anaerobic/aerobic digestion), municipal solid waste (MSW), biomass combustion, and landfilling. This sector also includes market development programs, such as the State's environmentally preferable and recycling-content product purchasing program. The primary source of GHG emissions from this sector is the direct emission of methane from the decomposition of organic material in landfills. This sector contributed approximately 2 percent of total statewide emissions in 2011. It is important to note that, in addition to reducing methane emissions from landfilled waste, recycling and reduction of waste will also reduce upstream GHG emissions associated with producing and transporting products. Although many of these upstream GHG emissions happen outside of California, California's waste policies can help reduce global GHG emissions. In California, regulations have been adopted to reduce emissions from the waste sector by 2 MMT. Mechanisms are being explored that can provide even greater GHG emission reductions.

The initial Scoping Plan identified several activities that would continue to move California forward in enhancing this integrated system for addressing waste-related issues and further reduce GHG emissions from this sector. These activities include landfill methane emission reductions, reduction in waste generation, and shifting waste to more beneficial uses. To achieve the greater level of recycling now required by AB 341, multiple alternative pathways for waste processing will need to occur. These pathways include: enhanced recycling/reuse/remanufacturing, composting and anaerobic digestion, and traditional biomass conversion.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the recycling and waste management sector measures is provided in Table 6. More details about measures that have been implemented since 2008, and a summary of their associated environmental analyses, follow this table.

Table 6 Summary of Recycling and Waste Management Sector Environmental Impacts in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(RW-1) Landfill Methane Control *(June 2009, early action item)*	**Air Quality** – Installation of control devices such as flares and energy recovery systems may slightly increase NO_X and CO. Water Resources - NO_X may be scrubbed out of the air and deposited into open water, adversely impacting water quality.	Include NO_X and CO in air district's emission inventory. Obtain offsets if landfill gas to energy project. Gas collection systems with flares or other combustion devices are currently the best means to reduce methane. Not quantified at this time. Use of BACT, collection systems would reduce impact.
(RW-2) Additional Reductions in Landfill Methane: Increasing the Efficiency of Landfill Methane Capture *(Ongoing)*	No adverse environmental impact – preparation of a Best Practices Guidance document.	None necessary.
(RW-3) High Recycling/ Zero Waste *(Adopted by CalRecycle January 2012; some strategies are ongoing)*	**Air Quality** – Composting facilities may emit VOCs and NO_X, which are criteria pollutants that contribute to ozone formation. Anaerobic digesters may emit air pollutants. **Water Resources** – Compost operations may adversely impact water quality if waste is discharged to the waters of the State.	Site- and project-specific analysis necessary for new facilities. Compliance with Permit to Construct from air district. Use of BACT. Application of a finished compost blanket would reduce VOC emissions for compost operations. Site- and project-specific analysis necessary for new facilities. Compliance with Permit to Construct from air district. Use of BACT. Compliance with waste discharge requirements.

After adoption of the initial Scoping Plan, the following programs were developed and implemented in furtherance of the measures identified above in Table 6. As part of

adoption of these programs, potential environmental impacts were analyzed and disclosed, and mitigation measures were recommended, as appropriate.

1. Landfill Methane Control

In June 2007, the Board identified a measure to reduce methane emissions from MSW landfills as a discrete early action measure. This proposed regulation was developed to implement this early action measure. The proposed regulation was developed in close collaboration with California Integrated Waste Management Board (CIWMB) staff.

The regulation requires owners and operators of certain smaller and other uncontrolled landfills to install gas collection and control systems. The regulation also includes requirements to ensure that existing and newly installed gas collection and control systems are operating optimally. At the time the regulation was being developed, there were about 367 landfills in ARB's landfill emissions inventory with the potential to generate methane emissions. Of these, 218 landfills (14 of which are uncontrolled) were expected to be subject to the proposed regulation.

As part of the EA prepared for this regulation, staff found no significant adverse impacts. Staff also found that reducing methane emissions would have a beneficial impact on climate change and would further reduce emissions of toxic compounds and ozone precursors that are also present in landfill gas (ARB 2010c).

The Landfill Methane Control measure was approved in June 2010.

8.0 FORESTS SECTOR

A. 2008 Scoping Plan Overview

California has a vast forest land base covering approximately 33 million acres, or roughly a third of the state. Approximately 60 percent of California's forests are on federal land, while about 40 percent of them are privately owned. Forests play a critical role in the State's carbon balance. Forests have the ability to remove CO_2 from the atmosphere and store or sequester it long-term as carbon in woody biomass and other plant material. Through conservation and management efforts, atmospheric removal of carbon through sequestration can be greater than the atmospheric emissions from processes such as fire, decomposition of wood, or harvest.

The State's forests also include urban trees. Trees in urban environments, or "urban forests," not only sequester CO_2, but also provide significant shading and other cooling benefits that reduce urban temperatures and energy needs.

The Scoping Plan included a Sustainable Forest Target. The goal of this Target was to maintain the current net forest sink. This could be achieved using the mechanisms provided by the Forest Practice Rules, timberland conversion regulations, fire safety

requirements, and forest improvement assistance programs, as well as CEQA, which requires avoidance or mitigation of forest carbon losses to conversion.

The Plan also identified other opportunities to realize additional net carbon uptake by trees, including:

- Preventing the conversion of forestlands through publicly and privately funded land acquisitions.
- Maintaining and enhancing forest stocks on timberlands through forest management practices subject to the Forest Practice Act.
- Planting trees on lands that were previously covered with native forests.
- Establishing forest areas where the preceding vegetation was not forest.
- Planting trees in urban areas.
- Using urban forest wood waste for biopower.
- Reducing vegetative fuels that could feed wildfires and using this waste for biopower.

The Board of Forestry and Fire Protection (BoF) has been evaluating the adequacy of existing forest regulations and programs for achieving GHG emission reductions and ensuring carbon sequestration in the forest sector. In 2010, amendments to CEQA guidelines led to the requirement that timber harvest proponents subject to State regulations must analyze GHG emissions when applying for CAL FIRE permits.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the forest sector measures is provided in Table 7.

Table 7 Summary of Environmental Impacts the Forest Sector in the 2008 FED

Measure *(Status/ Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(F-1) Sustainable Forest Target *(Ongoing)*	No significant adverse environmental impacts identified.	Project – level compliance with CEQA or NEPA would be accomplished by appropriate lead agencies.
Implementing Strategies: Forest Conservation, Forest Management, Afforestation/ Reforestation, Urban Forestry, and Fuels Management (Under Evaluation)	No significant adverse environmental impacts identified at this time.	Project – level compliance with CEQA or NEPA would be accomplished by appropriate lead agencies. Each of the strategies that have ground disturbing activities is an independent action and must be considered as such. Some activities will meet the definition

Table 7 Summary of Environmental Impacts the Forest Sector in the 2008 FED		
Measure ***(Status/ Consideration Date)***	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(Ongoing)		of a "project" under CEQA, while others will not be subject to CEQA. Projects taking place on federal lands are subject to NEPA.

9.0 HIGH GLOBAL WARMING POTENTIAL GASES SECTOR

A. 2008 Scoping Plan Overview

The concept of Global Warming Potential (GWP) was developed to compare the ability of each greenhouse gas (GHG) to trap heat in the atmosphere relative to another gas. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one equivalent unit mass of carbon dioxide (CO_2) over a specified time period. CO_2 has a GWP of 1. Methane (CH_4), however, has a GWP of 72, which is 72 times higher than CO_2. There are four major groups or types of high GWP gases: hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). The GWP values for high GWP gases can be hundreds to over ten thousand times higher than CO_2. High GWP gases are released primarily in two ways. The first is through leaking systems, and the second is during the disposal process. Once high GWP materials are released, they persist in the atmosphere for tens or even thousands of years.

The majority of high GWP emissions in California consist of HFCs. While they currently account for three percent of California's statewide GHG emissions inventory, concentrations are expected to increase in California due to the replacement of ozone depleting substances (ODS) in response to the Montreal Protocol mandates[4]. HFCs are a human-made chemical, and may be generally defined as compounds containing only hydrogen, fluorine, and carbon atoms. They were introduced as an alternative to chlorofluorocarbons (i.e., an ODS) in foam production, refrigeration, air conditioning

4 In September 1987, efforts to negotiate binding obligations to reduce the use of ODS led to the adoption of the Montreal Protocol on Substances that Deplete the Ozone Layer. HFCs are intentionally made fluorinated GHGs used as replacements for ozone-depleting substances. The United States, Canada, and Mexico together submitted a proposal to phase-down consumption and production of hydrofluorocarbons (HFCs) under the Montreal Protocol on Substances that Deplete the Ozone Layer in April 2013. On June 8, 2013, the United States and China entered into a preliminary agreement to phase down the production and consumption of HFCs between the two countries. Details of the phase-down schedules are under development.

systems, fire suppression systems, and the production of insulating foam. They do not significantly deplete the stratospheric ozone layer, but they are powerful GHGs with GWPs ranging from 140 (HFC-152a) to 11,700 (HFC-23).

The focus of the initial Scoping Plan measures associated with high GWP gases was primarily related to HFC emission reduction programs. These measures focused on two central themes to achieve 6.5 MMT of GHG emission reductions in 2020: (1) use lower-GWP alternatives for certain consumer products and new motor vehicle AC systems, and (2) avoid the release of high-GWP gases from such sources as electrical transmission equipment and particle accelerators, by using gas recovery options and leak tightness specifications.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the high GWP gases sector measures is provided in Table 8. More details about measures that have been implemented since 2008, and a summary of their associated environmental analyses, follow this table.

Table 8 Summary of High GWP Sector Environmental Impacts in the 2008 FED

Measure *(Status/Consideration Date)*		**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
H-1	Motor Vehicle Air-Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing *(January 2009, early action item)*	No adverse environmental impacts.	None necessary.
H-2	SF_6 Limits in Non-Utility and Non-Semiconductor Applications *(February 2009, early action item)*	**Hazards and Hazardous Materials** – If N_2O were used in place of SF_6 for fume hood tests, a potential exposure could occur if N_2O was accidentally released. Impacts to vulnerable populations should be considered. **Energy Demand** – SF_6 tracer tests for fume hoods are required by CAL/OSHA with a specific energy efficient technology. If ARB's regulation did not allow this test, some energy conservation efforts for fume	Ensure proper ventilation at exhaust stacks and ensure only verifiers are in the testing room. An exemption for this use or a change in the required test/standard would eliminate any impact to energy

Table 8 Summary of High GWP Sector Environmental Impacts in the 2008 FED			
Measure *(Status/Consideration Date)*		**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
		hood may not take place.	conservation efforts.
H-3	Reduction of Perfluorocarbons in Semiconductor Manufacturing *(February 2009, early action item)*	**Energy Demand** – Facilities operate continuously. Compliance achieved with additional abatement equipment could increase peak and off-peak natural gas and /or electricity use as thermal destruction of emissions requires high temperatures.	Purchases of highly energy efficient abatement equipment, purchases of catalytic destruction systems which operate at lower temperatures.
H-4	Limit Use of Compounds with High Global Warming Potentials in Consumer Products *(June 2008, early action item)*	**Air Quality** – Hydrocarbon propellants (butane, propane, isobutane) may have lower GWPs, but may contribute to the formation of ground-level ozone.	ARB to further evaluate employment of reformulation options.
H-5	High GWP Reductions from Mobile Sources *(Part of Advanced Clean Cars program; some measures not feasible at this time)*	No adverse environmental impacts known at this time, however, any alternatives will be subject to approval under US EPA's SNAP to ensure their safety. **Public Health and Safety** - It is possible that certain alternatives that industry selects may have a higher flammability index than the substances they replace.	Separate environmental evaluation will be prepared when regulation is developed. Additional technician training.
H-6	High GWP Reductions from Stationary Sources *(February 2010; some measures not feasible at this time)*	**Air Quality** – Potential CAPs and TACs from recovered foams if combusted. Though any alternatives will be subject to approval under US EPA's SNAP to ensure their safety, it is possible that certain alternatives that industry selects may have a higher flammability index than the substances they replace.	Separate environmental evaluation will be prepared when regulation is developed.

Table 8 Summary of High GWP Sector Environmental Impacts in the 2008 FED			
Measure *(Status/Consideration Date)*		**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
		Energy Demand – Facilities operate continuously. Compliance achieved with additional abatement equipment could increase peak and off-peak natural gas and /or electricity use as thermal destruction of emissions requires high temperatures.	Purchase and employment of highly energy efficient abatement equipment, and catalytic destruction systems which operate at lower temperatures.
H-7	Mitigation Fee on High GWP Gases *(Measure not feasible at this time)*	No adverse environmental impact anticipated.	None necessary.

After adoption of the initial Scoping Plan, the following programs were developed and implemented in furtherance of the measures in Table 8 above. As part of adoption of these programs, potential environmental impacts were analyzed and disclosed, and mitigation measures were recommended, as appropriate.

1. Advanced Clean Cars Program

As described above under the description of the Transportation Sector, California's Advanced Clean Cars program was approved by ARB in 2012, the EA of which was appended to the program text as Appendix B. The EA discusses both beneficial and adverse impacts on the environment as a result of the projected compliance responses to the proposed regulatory amendments, such as changes in State's vehicle fleet mix, use of different technologies, construction of fuel outlets and relevant manufacturing facilities, and resultant reductions in pollutant emissions. Among the range of environmental issues addressed in the EA, potentially significant and unavoidable environmental impacts were described for the following resources areas: aesthetics, biology, cultural resources, geology and soils, hazards (accidental releases), hydrology and water quality, noise, traffic (construction), and utilities. Less-than-significant environmental impacts were noted in regards to: agriculture and forest resources, land use and planning, mineral resources, population and housing, and recreation. Substantial beneficial environmental impacts, related to air quality and GHG emissions, would result from implementation of a new High GWP Program (ARB 2011a).

2. Sulfur Hexafluoride Leak Reduction Gas Insulated Switchgear

The SF_6 Leak Reduction Program for Gas Insulated Switchgear (GIS) was approved by ARB in 2010. The adopted regulations are expected to reduce 253,000 $MTCO_2$ over the 10-year regulatory period. Parties affected by the proposed regulation are required to have no more than a 10 percent SF_6 emission rate for their GIS equipment and to continue to reduce this annual emission rate by one percent per year beginning in 2011. Specific methods to attain these reductions are not set out in the adopted regulation. Rather, affected entities may determine which methods they will employ to meet the requirements.

The potential environmental impacts were described within the EA prepared within the Initial Statement of Reasons (ISOR) documents. ARB concluded that no significant adverse environmental or employee health impacts should occur from adoption of, and compliance with, the proposed regulation. An additional benefit of this emission reduction measure is a possible reduction in employee exposure to SF_6 toxic byproducts. Because the proposed regulation reduces only greenhouse gas emissions by improving SF_6 management practices, it is not expected to result in any significant adverse air quality, wastewater, or hazardous waste impacts. Consequently, no mitigation measures were recommended (ARB 2010d).

10.0 AGRICULTURAL SECTOR

A. 2008 Scoping Plan Overview

The agricultural sector includes on-site emissions from farm animals, equipment, crop production, and agricultural management practices. Emission sources in the agriculture sector include enteric fermentation (primarily belching by an animal), manure management, rice cultivation, energy use (including fuel combustion), crop residue burning, and soil management practices (fertilizer and manure applications). In 2011, agricultural sources accounted for about 7 percent of California's total GHG emissions.

However, the agricultural sector also is a carbon sink, whereby plants absorb CO_2 through photosynthesis, much of which is stored in plant matter and soils.

California's agricultural sector presents unique challenges to controlling GHG emissions due to its wide diversity of crop and livestock production across the state. The initial Scoping Plan considered voluntary steps to reduce GHG emissions in the agricultural sector in place of regulatory measures, due primarily to costs and scientific uncertainty in measuring GHG emissions in many agricultural systems.

The initial Scoping Plan identified a number of other potential GHG emission reduction activities in this sector, including improving agriculture water use efficiency, increasing the efficiency of or electrifying agricultural water pumps, using biomass-based fuels, and increasing carbon sequestration on agricultural lands.

B. Summary of Prior Environmental Impact Analysis

A summary of the environmental impacts associated with the agricultural sector measures is provided in Table 9. More details about measures that have been implemented since 2008, and a summary of their associated environmental analyses, follow this table.

Table 9 Summary of Agricultural Sector Environmental Impacts in the 2008 FED

Measure *(Status / Consideration Date)*	**Potential Adverse Environmental Impacts**	**Potential Mitigation Measures**
(A-1) Methane Capture at Large Dairies	**Air Quality** – The combustion of biogas in an engine to generate electricity can emit NO_X.	Controls can reduce NO_X in exhaust gasses, but types and sizes of engines typically used in conjunction with a dairy digester may be unavailable, or able to meet air district NO_X requirements. Use of BACT.
	Agricultural Resources – The siting of manure digesters may not be compatible with existing Williamson Act contracts.	Check with city or county to ensure compatibility.
	Biological Resources – construction activities of digester facility may impact biological resources.	Digesters will require CEQA compliance to obtain an "Authority to Construct" permit from the air district. Site specific analysis is necessary to determine whether an impact would result.
Fertilizer Use Efficiency	No adverse environmental impact anticipated	None necessary.
Efficiency Improvements	No adverse environmental impact anticipated	None necessary.

After adoption of the initial Scoping Plan, the following program was developed to implement the measures identified in Table 9 above. As part of adoption of these programs, potential environmental impacts were analyzed and disclosed, and mitigation measures were recommended, as appropriate.

1. Methane Capture at Large Dairies

Methane Capture at Large Dairies as described in the Compliance Offset Protocol Livestock Projects provides methods to quantify and report GHG emission reductions associated with the installation of a biogas control system (BCS) for manure management on dairy cattle and swine farms. The protocol focuses on quantifying the

change in methane emissions, but also accounts for effects on carbon dioxide emissions.

Offset Project Operators or Authorized Project Designees that install manure biogas capture and destruction technologies use the methods contained in this protocol to quantify and report GHG emissions. The protocol provides eligibility rules, methods to quantify GHG emission reductions, offset project-monitoring instructions, and procedures for preparing Offset Project Data Reports. Additionally, all offset projects must submit to annual, independent verification by ARB-accredited verification bodies. Requirements for verification bodies to verify Offset Project Data Reports are provided in the Cap-and-Trade Regulation.

Impacts associated with the Livestock Offset Protocol are described in the 2010 Cap-and-Trade Regulation FED. The FED concluded that protocol implementation would result in less-than-significant impacts to aesthetics, agricultural resources, air quality, biological resources, energy demand, geology, soils, and minerals, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, employment, population, and housing, public services, recreation, and utilities and service systems. Significant and unavoidable impacts could be associated with odors, cultural resources, noise, and transportation and traffic. As described above, under the Cap-and-Trade Sector discussion, this protocol was adopted as part of the Cap-and-Trade Regulation in October 2011 and became effective on January 1, 2012 (ARB 2011b).