4.6 GREENHOUSE GAS EMISSIONS

This section presents background information on GHG emissions, a summary of existing GHG conditions, and a summary of the regulatory framework that pertains to the proposed project. The section then provides an assessment of potential GHG emissions and related impacts that may result from construction and operation of the proposed project. This section is based on the GHG analysis of the proposed project prepared by Ambient Air Quality and Noise Consulting (Ambient, 2016) and contained in **Appendix D**.

Public and agency comments related to GHG emission were received during the public scoping period, and are summarized below:

- Evaluate potential GHG emissions and assess consistency with AB 32.

To the extent that issues identified in public comments involve potentially significant effects on the environment according to the CEQA and/or are raised by responsible agencies, they are identified and addressed within this EIR. For a complete list of public comments received during the public scoping period, refer to **Appendix A**, **NOP and Public Comment Letters**.

4.6.1 Environmental Setting

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the GHGs that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Primary GHGs attributed to global climate change, are discussed, as follows:

- **Carbon Dioxide**. CO_2 is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere (EPA, 2008).
- **Methane**. CH_4 is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of

methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (EPA, 2015a).

- **Nitrous Oxide**. N_2O is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 114 years (EPA, 2015b).
- **Hydrofluorocarbons.** HFCs are man-made chemicals, many of which have been **developed** as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes of less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years) (EPA, 2015c).
- **Perfluorocarbons.** PFCs are colorless, highly dense, chemically inert, and nontoxic. There are **seven** PFC gases: perfluoromethane (CF_4), perfluoroethane (C_2F_6), perfluoropropane (C_3F_8), perfluorobutane (C_4F_{10}), perfluorocyclobutane (C_4F_8), perfluoropentane (C_5F_{12}), and perfluorohexane (C_6F1_4). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF_4 and C_2F_6 as byproducts. The estimated atmospheric lifetimes for CF_4 and C_2F_6 are 50,000 and 10,000 years, respectively (EPA, 2015a).
- **Nitrogen Trifluoride**. Nitrogen trifluoride (NF_3) is an inorganic, colorless, odorless, toxic, nonflammable gas used as an etchant in microelectronics. Nitrogen trifluoride is predominantly employed in the cleaning of the plasma-enhanced chemical vapor deposition chambers in the production of liquid crystal displays and silicon-based thin film solar cells. It has a global warming potential (GWP) of 17,200 carbon dioxide equivalents (CO_2e). While NF_3 may have a lower GWP than other chemical etchants, it is still a potent GHG. In 2009, NF_3 was listed by California as a high GWP GHG to be listed and regulated under Assembly Bill (AB) 32 (Section 38505 Health and Safety Code).
- **Sulfur Hexafluoride**. SF_6 is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF_6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF_6 produced worldwide. Leaks of SF_6 occur from aging equipment and during equipment maintenance and servicing. SF_6 has an atmospheric life of 3,200 years (EPA, 2015e).
- **Black Carbon**. Black carbon is the most strongly light-absorbing component of PM emitted from burning fuels such as coal, diesel, and biomass. Black carbon contributes to climate change both directly by absorbing sunlight and indirectly by depositing on snow and by interacting with clouds and affecting cloud formation. Black carbon is considered a short-lived species, which can vary spatially and, consequently, it is very difficult to quantify associated global-warming potentials. 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 waste burning, and prescribed burning (planned burns of forest or wildlands). California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (ARB, 2014b).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Often, estimates of GHG emissions are presented in CO_2e, which weight each gas by its GWP. Expressing GHG emissions in carbon dioxide equivalents takes the contribution 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. **Table 4.6-1**, **Global Warming Potential Greenhouse Gases** shows the GWP for the GHG emissions of typical concern with regard to community development projects, based on a 100-year time horizon. As indicated, CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs roughly 298 times more heat per molecule than CO_2. Additional GHG with high GWP include NF_3, SF_6, PFCs, and black carbon.

Table 4.6-1. Global Warming Potential for Greenhouse Gases

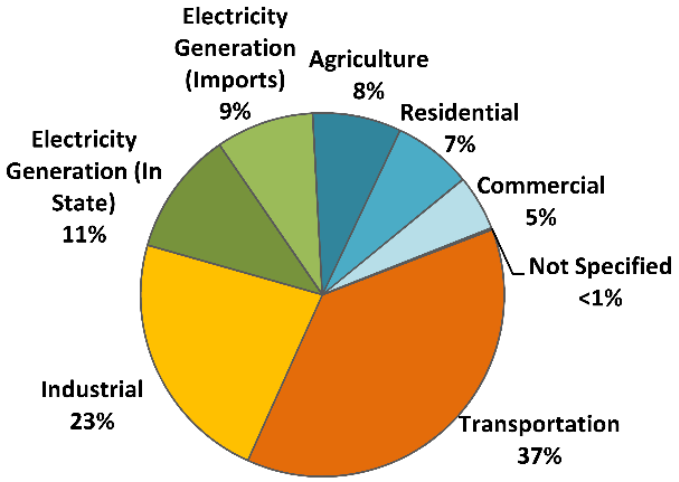
Greenhouse Gas	Global Warming Potential (100-year)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Oxide (N_2O)	298
**Based on Intergovernmental Panel on Climate Change (IPCC) GWP values for 100-year time horizon*	

4.6.1.1 Sources of Greenhouse Gas Emissions

On a global scale, GHG emissions are predominantly associated with activities related to energy production; changes in land use, such as deforestation and land clearing; industrial sources; agricultural activities; transportation; waste and wastewater generation; and commercial and residential land uses. World-wide, energy production including the burning of coal, natural gas, and oil for electricity and heat is the largest single source of global GHG emissions (EPA, 2015d).

In 2013, GHG emissions within California totaled 459 million metric tons (MMT) of CO_2e. GHG emissions, by sector, are summarized in **Figure 4.6-1**, **California Greenhouse Gas Emissions Inventory**. Within California, the transportation sector is the largest contributor, accounting for approximately 37 percent of the total statewide GHG emissions. Emissions associated with industrial uses are the second largest contributor, totaling roughly 23 percent. Electricity generation totaled roughly 20 percent (ARB, 2014a).

Figure 4.6-1. California Greenhouse Gas Emissions Inventory



Source: ARB, 2014a.

4.6.1.2 Effects of Global Climate Change

There are uncertainties as to exactly what the climate changes will be in various local areas of the earth. There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet: sea level rise, spread of certain diseases out of their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, extreme heat events, increased air pollution episodes, and the consequence of these effects on the economy.

Within California, climate changes would likely alter the ecological characteristics of many ecosystems throughout the State. Such alterations would likely include increases in surface temperatures and changes in the form, timing, and intensity of precipitation. For instance, historical records are depicting an increasing trend toward earlier snowmelt in the Sierra Nevada. This snow pack is a principal supply of water for the State, providing roughly 50 percent of State's annual runoff. If this trend continues, some areas of the State may experience an increased danger of floods during the winter months and possible exhaustion of the snowpack during spring and summer months. An earlier snowmelt would also impact the State's energy resources. Currently, approximately 20 percent of California's electricity comes from hydropower. An early exhaustion of the Sierra snowpack, may force electricity producers to switch to more costly or non-renewable forms of electricity generation during spring and summer months. A changing climate may also impact agricultural crop yields, coastal structures, and biodiversity. As a result, resultant changes in climate will likely have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (California Climate Change Center, 2015).

4.6.2 Regulatory Environment

Air quality within the NCCAB is regulated by several jurisdictions including the EPA, ARB, and the MBUAPCD. Each of these jurisdictions develops rules, regulations, and policies to attain the goals or directives imposed upon them through legislation. Although EPA regulations may not be superseded, both State and local regulations may be more stringent.

4.6.2.1 Federal

INTERNATIONAL REGULATION AND THE KYOTO PROTOCOL

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, Congress never ratified the protocol. The Federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the United States announced a strategy to reduce the GHG intensity of the American economy by 18 percent over a 10-year period from 2002 to 2012.

As part of the commitments to the UNFCCC, the EPA has developed an inventory of anthropogenic emissions by sources and removals by sinks of all GHGs. This inventory is periodically updated, with the latest update in 2010. The EPA reports that total U.S. emissions rose by 14 percent from 1990 to 2007, while the U.S. gross domestic product increased by 59 percent over the same period. A 2.9 percent decrease in emissions was noted from 2007 to 2008, which is reported to be attributable to climate conditions, reduced use of petroleum products for transportation, and increased use of natural gas over other fuel sources. The inventory notes that the transportation sector emits about 32 percent of CO_2 emissions, with 53 percent of those emissions coming from personal automobile use. Residential uses, primarily from energy use, accounted for 21 percent of CO_2 emissions (EPA, 2015a).

As a part of the EPA's responsibility to develop and update an inventory of U.S. GHG emissions and sinks, the EPA compared trends of other various U.S. data. Over the period between 1990 and 2008, GHG emissions grew at an average rate of about 0.7 percent per year. Population growth was slightly higher at 1.1 percent, while energy and fossil fuel consumption grew at 0.9 and 0.8 percent, respectively. Gross domestic product and energy generation grew at much higher rates.

EXECUTIVE ORDER 13514

Executive Order 13514 is focused on reducing GHGs internally in Federal agency missions, programs and operations, but also directs Federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. EPA, 549 U.S. 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act and that the EPA has the authority to regulate GHGs. The Court held that the EPA Administrator must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the EPA's Proposed Greenhouse Gas Emission Standards for Light-

Duty Vehicles, which was published on September 15, 2009. On May 7, 2010 the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards* was published in the FR.

EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations. These steps were outlined by President Obama in a Presidential Memorandum on May 21, 2010.

The final combined EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile (the equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements). Together, these standards will cut GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). On November 16, 2011, EPA and NHTSA issued their joint proposal to extend this national program of coordinated GHG and fuel economy standards to model years 2017 through 2025 passenger vehicles (Caltrans, 2015).

4.6.2.2 State

ASSEMBLY BILL 1493

AB 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the ARB to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as Pavley I. The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the State's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from Federal clean air regulations, as the State is authorized to do under the Clean Air Act, to allow the State to require reduced tailpipe emissions of CO_2. In late 2007, the EPA denied California's waiver request and declined to promulgate adequate Federal regulations limiting GHG emissions. In early 2008, the State brought suit against the EPA related to this denial.

In January 2009, President Obama instructed the EPA to reconsider the Bush Administration's denial of California's and 13 other States' requests to implement global warming pollution standards for cars and trucks. In June 2009, the EPA granted California's waiver request, enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

Also in 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the U.S. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with

State requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

EXECUTIVE ORDER NO. S-3-05

Executive Order S-3-05 (State of California) 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 GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the secretary of the Cal-EPA to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and State legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the secretary of Cal-EPA created a Climate Action Team made up of members from various State agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic reports on progress. 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.

EXECUTIVE ORDER S-6-06

Executive Order S-6-06 (State of California), signed on April 25, 2006, established two primary goals related to the use of biofuels within California, including: (1) by 2010, 20 percent of its biofuels need to be produced within California; increasing to 40 percent by 2020 and 75 percent by 2050; and (2) by 2010, 20 percent of the renewable electricity should be generated from biomass resources within the State, maintaining this level through 2020.

EXECUTIVE ORDER NO. S-01-07

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS) was issued on January 18, 2007 and called for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. This order instructed the Cal-EPA to coordinate activities between the University of California, the CEC and other State agencies to develop and propose a draft compliance schedule to meet the 2020 target. Furthermore, it directed ARB to consider initiating a regulatory proceeding to establish and implement the LCFS. In response, ARB adopted the LCFS regulation in 2010.

ASSEMBLY BILL 32 - CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, NF_3, and SF_6. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32 (ARB, 2014b).

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 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.

CLIMATE CHANGE SCOPING PLAN

In October 2008, ARB published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32. The Scoping Plan contains the main strategies California will implement to achieve reduction of roughly 169 million metric tons of CO_2e, or approximately 29 percent from the State's projected 2020 emissions level in comparison to business-as-usual (BAU) 2002–2004 conditions. The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. The largest proposed GHG reduction recommendations are from improving emissions standards for light-duty vehicles (estimated reductions of 31.7 $MMTCO_2e$), implementation of the Low Carbon Fuel Standard (15.0 $MMTCO_2e$) program, energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 $MMTCO_2e$), and a renewable portfolio standard for electricity production (21.3 $MMTCO_2e$). The Scoping Plan identifies the local equivalent of AB 32 targets as a 15 percent reduction below baseline GHG emissions level, with baseline interpreted as GHG emissions levels between 2003 and 2008.

Key components of the Scoping Plan focus on energy efficiency, conservation, and use of renewable energy. For instance, the Renewable Portfolio Standard, which is intended to increase the percentage of renewables in California's electricity mix to 33 percent by year 2020, would result in a reduction of 21.3 $MMTCO_2e$. Sources of renewable energy include, but are not limited to, biomass, wind, solar, geothermal, hydroelectric, and anaerobic digestion. Increasing the use of renewables will decrease California's reliance on fossil fuels, thus reducing GHG emissions. The Scoping Plan also recognizes that land use planning and urban growth decisions will play important roles in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions.

The Scoping Plan was first approved by the Board in 2008 and must be updated every five years. The first update of the Scoping Plan was approved by ARB on May 22, 2014, which looked past 2020 to set mid-term goals to reach post 2020 emission-reduction targets.

EXECUTIVE ORDER B-30-15

On April 29, 2015, the Governor issued Executive Order B-30-15 establishing a mid-term GHG reduction target for California of 40 percent below 1990 levels by 2030. All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. ARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target, and therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to achieve continue reductions in GHG emissions.

SENATE BILL 1368

Senate Bill (SB) 1368 (codified at Public Utilities Code Chapter 3) is the companion bill of AB 32. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emissions performance standard for baseload generation from investor-owned utilities by February 1, 2007. The bill also required the CEC to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural-gas-fired plant. The

legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and the CEC.

SENATE BILL 1078 AND GOVERNOR'S ORDER S-14-08 (CALIFORNIA RENEWABLES PORTFOLIO STANDARDS)

SB 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewables Portfolio Standard target to 33 percent by 2020. It directed State government agencies and retail sellers of electricity to take all appropriate actions to implement this target. Executive Order S-14-08 was later superseded by Executive Order S-21-09 on September 15, 2009. Executive Order S-21-09 directed ARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. This Executive Order was superseded by statute SB X1-2 in 2011, which obligates all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020, with interim targets of 20 percent by 2013 and 25 percent by 2016.

ARB is required by current law, AB 32 of 2006, to regulate sources of GHGs to meet a State goal of reducing GHG emissions to 1990 levels by 2020 and an 80 percent reduction of 1990 levels by 2050. The CEC and CPUC serve in advisory roles to help ARB develop the regulations to administer the 33 percent by 2020 requirement. ARB is also authorized to increase the target and accelerate and expand the time frame.

MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS

Reporting of GHGs by major sources is required by the AB 32. Revisions to the existing ARB mandatory GHG reporting regulation were considered at the board hearing on December 16, 2010. The revised regulation was approved by the California Office of Administrative Law and became effective on January 1, 2012. The revised regulation affects industrial facilities, suppliers of transportation fuels, natural gas, natural gas liquids, liquefied petroleum gas, and CO_2, operators of petroleum and natural gas systems, and electricity retail providers and marketers.

CAP-AND-TRADE REGULATION

The cap-and-trade regulation is a key element in California's climate plan. It sets a statewide limit on sources responsible for 85 percent of California's GHG emissions, and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The cap-and-trade rules came into effect on January 1, 2013 and apply to large electric power plants and large industrial plants. In 2015, they extended the regulation to fuel distributors (including distributors of heating and transportation fuels). The program encompasses around 360 businesses throughout California and nearly 85 percent of the State's total GHG emissions.

Under the cap-and-trade regulation, companies must hold enough emission allowances to cover their emissions, and are free to buy and sell allowances on the open market. California held its first auction of GHG allowances on November 14, 2012. California's GHG cap-and-trade system will reduce GHG emissions from regulated entities by approximately 16 percent, or more, by 2020.

CALIFORNIA BUILDING CODE

The California Building Code (CBC) contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or

rehabilitation of a building or other improvement to real property. The CBC is adopted every three years by the Building Standards Commission (BSC). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Green Building Standards

In essence, green buildings standards are indistinguishable from any other building standards. Both are contained in the California Building Code and regulate the construction of new buildings and improvements. The only practical distinction between the two is that whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

AB 32, which mandates the reduction in GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In its scoping plan for the implementation of AB 32, ARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25 percent of all such emissions. In recommending a green building strategy as one element of the scoping plan, ARB estimated that green building standards would reduce GHG emissions by approximately 26 million metric tons of CO_2e ($MMTCO_2e$) by 2020.

The green buildings standards, commonly referred to as CalGreen standards, were most recently updated in 2013. The 2013 building energy efficiency standards are 25 percent more efficient than previous standards for residential construction and 30 percent more efficient for non-residential construction (CEC, 2015).

4.6.3 Impacts and Mitigation

4.6.3.1 Thresholds of Significance

Based on Appendix G of the State CEQA Guidelines, the project would have a significant GHG emissions impact if it would:

a. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

b. Conflict with any applicable plan, policy, or regulations of an agency adopted for the purpose of reducing the emissions of GHGs.

4.6.3.2 Impact Analysis Overview

APPROACH TO ANALYSIS

Neither the State of California nor the MBUAPCD have identified quantitative thresholds of significance for the evaluation of project-generated GHGs. In addition, it is important to note that AB 32 does not establish a statutory mandate that requires local air pollution control districts to establish GHG significance thresholds for CEQA purposes. However, to date, several air districts have identified GHG significance thresholds. Most recently, the Sacramento Metropolitan Air Quality Management District (SMAQMD) has identified recommended GHG thresholds of significance to be used for the analysis of project-related impacts. For construction and operational activities, the SMAQMD recommends a GHG mass-emissions threshold of 1,100 metric tons of CO_2e per year ($MTCO_2e$/year) to be applied for the

assessment of short-term construction and long-term operational impacts. The SMAQMD's recommended GHG significance threshold is generally consistent with mass-emissions thresholds recommended by other air districts for the evaluation of GHG impacts. For instance, the San Luis Obispo County Air Pollution Control District (SLOAPCD) has identified a recommended GHG significance threshold of 1,150 $MTCO_2e$/year and the Bay Area Air Quality Management District (BAAQMD) has identified a recommended GHG mass-emissions threshold of 1,100 $MTCO_2e$/year.

Unlike criteria air pollutants that primarily affect the local or regional environment within which they are emitted, GHG emissions are evaluated based on potential impacts to the global environment and, hence, are inherently a cumulative impact. For this reason, some air districts have advocated for consideration of more regional GHG emission thresholds that are not necessarily limited to air district boundaries or air basins. For instance, the Ventura County Air Pollution Control District is coordinating with the South Coast Air Quality Management District to identify GHG emission thresholds that would help to streamline CEQA project-level analysis and be consistent with those applied within other areas of Southern California (Ventura County Air Pollution Control District, 2011). Similarly, the MBUAPCD worked with SLOAPCD on a work plan for development of a regional CEQA GHG threshold, which was the basis for the GHG thresholds currently adopted by SLOAPCD. The MBUAPCD currently considers the use of CEQA thresholds identified by other air districts, including the neighboring SLOAPCD- or BAAQMD-recommended GHG significance thresholds, to be adequate for the analysis of CEQA GHG impacts. It is also important to note that the GHG significance thresholds currently being recommended by the above-discussed air districts are based on AB 32 GHG emission reduction goals, which take into consideration the emission reduction strategies outlined in ARB's Scoping Plan. As such, project-generated emissions that would exceed these thresholds would be considered to have a potentially significant impact on the environment that could conflict with the GHG-reduction goals of AB 32. For purposes of this analysis, project-generated emissions in excess of 1,100 $MTCO_2e$/year would be considered to have a potentially significant impact on the environment that could conflict with the GHG-reduction goals of AB 32.

AREAS OF NO IMPACT

The proposed project would not result in impacts related to significance criterions (b) above, as explained below. The impact analyses related to the other criterion (a) is addressed in the following section.

(b) Conflict with any applicable plan, policy, or regulations of an agency adopted for the purpose of reducing the emissions of GHGs. (No impact during construction or operation of the proposed project). There are no locally adopted GHG Emissions Reduction Plans. The proposed project would not conflict with provisions or implementation of the State Scoping Plan. Therefore, the proposed project would not conflict with existing plans or regulations regarding reduction of GHG emissions.

4.6.3.3 Impacts and Mitigation Measures

Impact GHG-1: Construction Greenhouse Gas Emissions. Construction of the proposed EPB and SRPS project components and implementation of the proposed ISMP project component would generate GHG emissions, either directly or indirectly, but would not make a considerable contribution to significant cumulative impacts due to GHG emissions and the related global climate change impacts. (Criterion a) (EPB: Less-Than-Significant) (SRPS: Less-than-Significant) (ISMP: Less-than-Significant) (Project Overall: Less-than-Significant)

Estimated increases in GHG emissions associated with construction of the proposed project are summarized in **Table 4.6-2**, **Construction Greenhouse Gas Emissions**. Assuming that the proposed EPB and SRPS project components were to be constructed within a single year concurrent with implementation of the proposed ISMP project component, annual emissions of GHG associated with project construction would total approximately 255 $MTCO_2e$. Amortized GHG emissions, when averaged over an assumed 25-year project life, would total approximately 10.2 $MTCO_2e$/year. There would also be a small amount of GHG emissions from waste generated during construction; however, this amount is speculative. Actual emissions may vary, depending on the final construction schedules, equipment required, and activities conducted. Assuming that all construction activities were to occur in the same year, construction-generated GHG emissions would not exceed 1,100 $MTCO_2e$/year and would have a less-than-significant impact. To ensure a conservative analysis, amortized construction-generated emissions were also included in the operational GHG emissions assessment discussed in the following section.

Table 4.6-2. Construction Greenhouse Gas Emissions

Proposed Project Component	Annual Emissions ($MTCO_2e$/Year)[1]
EPB	112
SRPS	141
ISMP	2
Total Emissions all Proposed Project Components:	255
Amortized Net Change in Construction Emissions:[2]	10.2

1. Assumes all construction components would occur within a single year.
2. Amortized emissions are quantified based on an estimated 25-year project life.

Impact Conclusion

Construction of the proposed project would not result in GHG emissions that would have a significant impact on the environment, nor would the proposed project conflict with applicable GHG-reduction plans, policies or regulations. This impact is less-than-significant. No mitigation is required

Impact GHG-2: <u>Operational Greenhouse Gas Emissions.</u> Operation of the proposed project would generate GHG emissions, either directly or indirectly. These emissions would not exceed significance thresholds such that they would result in a considerable contribution to significant cumulative impacts of GHG emissions and the related global climate change impacts. (Criterion a) (EPB: Less-than-Significant) (SRPS: Less-than-Significant) (ISMP: No Impact) (Project Overall: Less-than-Significant)

Operational emissions would be primarily associated with occasional maintenance-related activities, emergency generator operation, and electricity use associated with the operation of the pumps. Operational emissions are summarized in **Table 4.6-3**, **Operational GHG Emissions**. With the inclusion of amortized construction emissions the proposed project would generate an estimated total 59.6 $MTCO_2e$/year. Annual GHG emissions would not exceed the threshold of 1,100 $MTCO_2e$.

Table 4.6-3. Operational GHG Emissions

Proposed Project Component/Source	Annual Emissions ($MTCO_2e$/year) [1]
EPB	
Architectural Coatings[2]	0.0
Off-road Maintenance Equipment[3]	16.5
Maintenance Worker On-road Motor Vehicles [4]	0.8
Electricity Use[5]	9.5
Emergency Generator [6]	5.3
Total EPB Emissions:	32.1
SRPS	
Off-road Maintenance Equipment[3]	16.5
Maintenance Worker On-road Motor Vehicles [4]	0.8
Total SRPS Emissions:	17.3
Amortized Construction Emissions[1]:	10.2
Maximum Annual Emissions [7]:	59.6
Significance Threshold:	1,100
Exceed Significance Threshold/Significant Impact?	No

1. *Assumes all operational activities would occur within a given year.*
2. *Assumes equivalent of 1,200 square feet repainted annually, based on the estimated total interior/exterior wall area of the proposed control building, assuming all surfaces would be painted. Includes on-site and off-site emissions.*
3. *Includes 1 tractor for landscape maintenance and 1 portable generator for architectural coating application.*
4. *Assumes four worker trips/day, one day/week, 52 weeks/year (208 worker trips annually).*
5. *Assumes operation of one duty pump (100 hp) and one jockey pump (25 hp) approximately 360 operational hours annually.*
6. *Assumes 250 bhp, diesel-fueled emergency generator. 50 operational hours annuallyper MBUAPCD permitting requirements.*
7. *Amortized emissions are quantified based on an estimated 25-year project life (refer to **Table 4.6-2**).*

Impact Conclusion

Operation of the proposed project would not result in GHG emissions that would have a significant impact on the environment, nor would the proposed project conflict with applicable GHG-reduction plans, policies or regulations. This impact is less-than-significant. No mitigation is required.

4.6.4 References

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