SECTION 3.6
Greenhouse Gas Emissions and Energy

3.6.1 Introduction

This section evaluates the potential GHG and energy impacts associated with construction activities, mobile sources, and other aspects of the proposed program's construction and operations. The objectives of this analysis are to:

- Evaluate the construction and operational GHG emissions associated with program level restoration process and the potential for GHG impacts based on applicable standards and thresholds;
- Identify GHG benefits from improving habitat areas and restoring wetlands;
- Provide, if needed, GHG mitigation measures as required to meet applicable GHG standards and thresholds; and
- Identify potential energy impacts with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

This section relies on the analysis conducted in the Greenhouse Gas Emissions Technical Report, provided in Appendix F, and is consistent with Section 15126.2(b) of the 2019 CEQA Guidelines to evaluate a project's energy use. Detailed energy calculations can be found in Appendix G. All information sources used are included as citations within the text; sources are listed in Section 3.6.7, *References*.

3.6.2 Environmental Setting

3.6.2.1 Global Climate Change and Greenhouse Gases

Global climate change refers to changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation and storms. Historical records indicate that global climate changes have occurred in the past due to natural phenomena; however, current data increasingly indicate that the current global conditions differ from past climate changes in rate and magnitude. Global climate change attributable to anthropogenic (human) GHG emissions is currently one of the most important and widely debated scientific, economic and political issues in the United States and the world. The extent to which increased concentrations of GHGs have caused or will cause climate change and the appropriate actions to limit and/or respond to climate change are the subject of significant and rapidly evolving regulatory efforts at the federal and state levels of government.

GHGs are compounds in the Earth's atmosphere which play a critical role in determining temperature near the Earth's surface. More specifically, these gases allow high-frequency shortwave solar radiation to enter the Earth's atmosphere, but retain some of the low frequency infrared energy which is radiated back from the Earth towards space, resulting in a warming of the atmosphere. Not all GHGs possess the same ability to induce climate change; as a result, GHG contributions are commonly quantified in the units of equivalent mass of carbon dioxide (CO_2e). Mass emissions are calculated by converting pollutant specific emissions to CO_2e emissions by applying the proper global warming potential (GWP) value.[1] These GWP ratios are provided by the Intergovernmental Panel on Climate Change (IPCC) in its Fourth Assessment Report (AR4) (IPCC, 2017). By applying the GWP ratios, program-related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline. The CO_2e values are calculated for construction years as well as existing and program build-out conditions in order to generate a net change in GHG emissions for construction and operation. Compounds that are regulated by the State of California as GHGs are discussed below.

- **Carbon Dioxide (CO_2):** CO_2 is the most abundant anthropogenic GHG in the atmosphere and is primarily generated from fossil fuel combustion from stationary and mobile sources. CO_2 is the reference gas (GWP of 1) for determining the GWPs of other GHGs.
- **Methane (CH_4):** CH_4 is emitted from biogenic sources (i.e., resulting from the activity of living organisms), incomplete combustion in forest fires, anaerobic decomposition of organic matter in landfills, manure management, and leaks in natural gas pipelines. The GWP of CH_4 is 21 in the IPCC SAR and 25 in the IPCC AR4.
- **Nitrous Oxide (N_2O):** N_2O produced by human-related sources including agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N_2O is 310 in the IPCC SAR and 298 in the IPCC AR4.
- **Hydrofluorocarbons (HFCs):** HFCs are fluorinated compounds consisting of hydrogen, carbon, and fluorine. They are typically used as refrigerants in both stationary refrigeration and mobile air conditioning systems. The GWPs of HFCs range from 140 for HFC-152a to 11,700 for HFC-23 in the IPCC SAR and 124 for HFC-152a to 14,800 for HFC-23 in the IPCC AR4.
- **Perfluorocarbons (PFCs):** PFCs are fluorinated compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. The GWPs of PFCs range from 6,500 to 9,200 in the IPCC SAR and 7,390 to 17,700 in the IPCC AR4.
- **Sulfur Hexafluoride (SF_6):** SF_6 is a fluorinated compound consisting of sulfur and fluoride. It is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 has a GWP of 23,900 in the IPCC SAR and 22,800 in the IPCC AR4.

[1] GWPs and associated CO_2e values were developed by the Intergovernmental Panel on Climate Change (IPCC), and published in its Second Assessment Report (SAR) in 1996. Historically, GHG emission inventories have been calculated using the GWPs from the IPCC's SAR. The IPCC updated the GWP values based on the latest science in its Fourth Assessment Report (AR4). The California Air Resources Board (CARB) reports GHG emission inventories for California using the GWP values from the IPCC AR4. Therefore, the analysis below reflected the GWP values from IPCC AR4. Although the IPCC has released AR5 with updated GWPs, CARB reports the statewide GHG inventory using the AR4 GWPs, which is consistent with international reporting standards.

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the IPCC's Fifth Assessment Report, Summary for Policy Makers states that, "it is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together" (IPCC, 2014, p. 5). A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity.

According to the California Air Resources Board (CARB), the potential impacts in California due to global climate change may include: loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, more drought years, increased erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems, and increased pest infestation.

3.6.2.2 Adaptation

Adaptation refers to proposed program's resiliency to potential climate change impacts. Global warming is already having a profound impact on water resources. Climate change already altered the weather patterns and water supply in California leading to increased water shortages (i.e., a dwindling snowpack, bigger flood flows, rising sea levels, longer and harsher droughts). Water supplies are also at risk from rising sea levels. Risks may include degradation of California's estuaries, wetlands, and groundwater aquifers that would threaten the quality and reliability of the major California fresh water supply.

Climate change could potentially affect: the amount of snowfall, rainfall and snow pack, the intensity and frequency of storms, flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events), sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Adaptation includes the responses to the changing climate and policies to minimize the predicted impacts (e.g., building better coastal defenses to sea level rise). Adaptation strategies are not included in this report directly, but the project design did consider sea level rise. It should be noted that adaptation is not mitigation. Mitigation includes intervention or policies to reduce GHG emissions or to enhance the sinks of GHGs.

3.6.2.3 Greenhouse Gas Emission Inventories

Global

To put perspective on the emissions generated by a program and to better understand the sources of GHGs, it is important to look at global emission inventories. The Global Carbon Project has been tracking greenhouse gases and the global carbon cycle since its establishment in 2001. The Global Carbon Project estimate for CO_2 emissions for the world and for the top ten CO_2 producing countries is presented in **Table 3.6-1**, *Top Ten CO_2-Producing Nations in 2017 (Million Metric Tons [MMT] CO_2)*.

TABLE 3.6-1
TOP TEN CO_2-PRODUCING NATIONS IN 2017 (MILLION METRIC TONS [MMT] CO_2)

Country	Emissions	Percent of Global
1. China	9,839	27%
2. United States	5,270	15%
3. India	2,467	7%
4. Russian Federation	1,693	5%
5. Japan	1,205	3%
6. Germany	799	2%
7. Iran	672	2%
8. Saudi Arabia	635	2%
9. South Korea	616	2%
10. Canada	573	2%
Remaining Countries	*12,384*	*34%*
Total Global	**36,153**	**100%**

SOURCE: Global Carbon Atlas, http://www.globalcarbonatlas.org/en/CO2-emissions, accessed April 2019.

Global CO_2 emissions totaled about 36,153 $MMTCO_2$ in 2017. China released more than a quarter of the global CO_2 emissions. The United States was second and has historical significance for releasing GHG emissions, but it has been slowly decreasing its annual emissions since its peak in 2007 (Global Carbon Atlas, 2019). The data in Table 3.6-1 emphasize the major role that the United States and China play in climate change with the two countries accounting for 42% of the emissions. India has increased its emissions at an annual rate of 5 percent from 2004 to 2014 as the population grew and improved their living standards (Global Carbon Atlas, 2019).

State of California

CARB compiles GHG inventories for the State of California. Based on the 2017 GHG inventory data prepared by CARB in 2019, California emitted 429.1 million metric tons of CO_2e ($MMTCO_2e$) including emissions resulting from imported electrical power (CARB, 2019). Between 1990 and 2017, the population of California grew by approximately 9.7 million (from 29.8 to 39.5 million) (US Census Bureau, 2017. California Department of Finance, 2018). This represents an increase of approximately 33 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $773 billion in 1990 to $2.75 trillion in 2017

representing an increase of approximately three times the 1990 gross state product) (California Department of Finance, 2019). Despite the population and economic growth, California's net GHG emissions were reduced to below 1990 levels in 2017 (California's 2016 GHG emissions were also below 1990 levels). According to CARB, the declining trend coupled with the state's GHG reduction programs (such as the Renewables Portfolio Standard, Low Carbon Fuel Standard, vehicle efficiency standards, and declining caps under the Cap and Trade Program) demonstrate that California has met the 2020 GHG reduction target codified in California Health and Safety Code (HSC), Division 25.5, also known as The Global Warming Solutions Act of 2006 (AB 32) (CARB, 2017). **Table 3.6-2**, *State of California Greenhouse Gas Emissions*, identifies and quantifies statewide anthropogenic GHG emissions and sinks (e.g., carbon sequestration due to forest growth) in 1990 and 2017. As shown in the table, the transportation sector is the largest contributor to statewide GHG emissions at approximately 40 percent in 2017.

TABLE 3.6-2
STATE OF CALIFORNIA GREENHOUSE GAS EMISSIONS

Category	Total 1990 Emissions using IPCC SAR ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2017 Emissions using IPCC AR4 ($MMTCO_2e$)	Percent of Total 2017 Emissions
Transportation	150.7	26%	169.9	40%
Electric Power	110.6	3%	62.4	15%
Commercial	14.4	7%	15.1	4%
Residential	29.7	24%	26.0	6%
Industrial	103.0	0%	89.4	21%
Recycling and Waste[a]	–	–	8.9	2%
High GWP/Non-Specified[b]	1.3	<1%	20.0	5%
Agriculture/Forestry	23.6	-2%	32.4	8%
Forestry Sinks	-6.7		—[c]	—
Net Total (IPCC SAR)	**426.6**	**100%**	**—**	**—**
Net Total (IPCC AR4)[d]	**431**	**100%**	**429.1**	**100%**

[a] Included in other categories for the 1990 emissions inventory.
[b] High GWP gases are not specifically called out in the 1990 emissions inventory.
[c] Revised methodology under development (not reported for 2017).
[d] CARB revised the State's 1990 level GHG emissions using GWPs from the IPCC AR4.
SOURCE: CARB, 2019.

These categories are broadly defined as (CARB, 2018):

- **Transportation** includes the combustion of fuels sold in-state that are used by on-road and off-road vehicles, aviation, rail, and water-borne vehicles, as well as a few other smaller sources.
- **Industrial** GHG emissions are produced from many industrial activities. Major contributors include oil and natural gas extraction, refineries, cement manufacturing, chemical manufacturing, and a portion of cogeneration emissions attributed to thermal energy output.
- **Electric generation** includes both emissions from in-state power generation (including the portion of cogeneration emissions attributed to electricity generation) and emissions from imported electricity.

- **Agriculture** includes enteric fermentation and manure management from livestock, crop production (fertilizer use, soil preparation and disturbance, and crop residue burning), and fuel combustion associated with agricultural activities (water pumping, cooling or heating buildings, and processing commodities).
- **Commercial and residential** uses generate GHG emissions primarily from the combustion of natural gas and other fuels for space and water heating, cooking, or steam generation.
- **Recycling and waste** includes primarily landfills and a small fraction from compost production facilities.
- **High (GWP)** emissions consist of releases of ozone depleting substance substitutes and electricity losses from the transmission and distribution system.

3.6.2.4 Electricity

Electricity, a consumptive utility, is a man-made resource. The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources, into energy. The delivery of electricity involves a number of system components, including substations and transformers that lower transmission line power (voltage) to a level appropriate for on-site distribution and use. The electricity generated is distributed through a network of transmission and distribution lines commonly called a power grid. Conveyance of electricity through transmission lines is typically responsive to market demands.

Energy capacity, or electrical power, is generally measured in watts (W) while energy use is measured in watt-hours (Wh). For example, if a light bulb has a capacity rating of 100 W, the energy required to keep the bulb on for 1 hour would be 100 Wh. If ten 100 W bulbs were on for 1 hour, the energy required would be 1,000 Wh or 1 kilowatt-hour (kWh). On a utility scale, a generator's capacity is typically rated in megawatts (MW), which is one million watts, while energy usage is measured in megawatt-hours (MWh) or gigawatt-hours (GWh), which is one billion watt-hours.

Southern California Edison is the electricity provider for the program area. SCE provides electricity to approximately 15 million people, 180 incorporated cities, 15 counties, 5,000 large businesses, and 280,000 small businesses throughout its 50,000-square-mile service area (CEC, 2017b). SCE is required to commit to the use of renewable energy sources for compliance with the Renewables Portfolio Standard. SCE is required to meet the requirement to procure at least 33 percent of its energy portfolio from renewable sources by 2020 through the procurement of energy from eligible renewable resources. Senate Bill (SB) 350 (Chapter 547, Statues of 2015) further increased the Renewables Portfolio Standard to 50 percent by 2030. Most recently, SCE provided approximately 32 percent of its 2017 electric supply from renewable power (CEC, 2017).

3.6.2.5 Natural Gas

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from naturally occurring reservoirs, but relies upon out-of-state imports for nearly 90 percent of its natural gas supply (CEC, 2019a). A majority of natural gas consumed in California is for electricity generation, along with the industrial, residential, and commercial sections (CEC, 2019a). Among energy

commodities consumed in California, natural gas accounts for one-third of them (CEC, 2019b). Natural gas is measured in terms of cubic feet (cf).

Natural gas is provided to the proposed program by the Southern California Gas Company (SoCalGas). SoCalGas is the principal distributor of natural gas in Southern California, serving residential, commercial, and industrial markets. SoCalGas serves approximately 21.6 million customers in more than 500 communities encompassing approximately 20,000 square miles throughout Central and Southern California, from the City of Visalia to the Mexican border (SoCalGas, 2018).

SoCalGas receives gas supplies from several sedimentary basins in the western United States and Canada, including supply basins located in New Mexico (San Juan Basin), West Texas (Permian Basin), the Rocky Mountains, and Western Canada as well as local California supplies (California Gas and Electric, 2018~~a~~). The traditional, southwestern United States sources of natural gas will continue to supply most of SoCalGas' natural gas demand. The Rocky Mountain supply is available but is used as an alternative supplementary supply source, and the use of Canadian sources provide only a small share of SoCalGas supplies due to the high cost of transport (California Gas and Electric Utilities, 2016b). Gas supply available to SoCalGas from California sources averaged 84 million standard cubic feet (scf) per day in 2017 (the most recent year for which data are available) (California Gas and Electric Utilities, 2018~~a~~). Total annual natural gas sale to customers in 2017 was approximately 913,960 million scf (California Gas and Electric Utilities, 2018~~b~~).[2]

3.6.2.6 Transportation Energy

According to the California Energy Commission (CEC), transportation accounts for nearly 38.5 percent of California's total energy consumption in 2015 (California Energy Commission, 2017). In 2017, California consumed 15.5 billion gallons of gasoline and 3.8 billion gallons of diesel fuel (California Energy Commission, 2018). Petroleum-based fuels currently account for more than 90 percent of California's transportation fuel use (California Energy Commission, 2016). However, the state is now working on developing flexible strategies to reduce petroleum use. Over the last decade, California has implemented several policies, rules, and regulations to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and GHGs from the transportation sector, and reduce vehicle miles traveled (VMT). Accordingly, gasoline consumption in California has declined. The CEC predicts that the demand for gasoline will continue to decline over the next 10 years, and there will be an increase in the use of alternative fuels (California Energy Commission, 2015). According to fuel sales data from the CEC, fuel consumption in Los Angeles County was approximately 3.66 billion gallons of gasoline and 0.301 billion gallons of diesel fuel in 2017 (California Energy Commission, 2018). Fuel consumption in Orange County was approximately 1.38 billion gallons of gasoline and 0.061 billion gallons of diesel fuel in 2017 (California Energy Commission, 2018).

[2] Daily natural gas usage in 2017 was 2,504 million scf, annual value derived by multiplying daily values by 365 days.

3.6.3 Regulatory Framework

3.6.3.1 Federal

Voluntary Programs

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address GHGs. The federal government administers a wide array of public-private partnerships to reduce the GHG intensity generated in the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA implements numerous voluntary programs that contribute to the reduction of GHG emissions. These programs (e.g., the ENERGY STAR labeling system for energy-efficient products) play a significant role in encouraging voluntary reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

Light Duty Vehicle GHG and Fuel Efficiency Standards

In August 2012, the USEPA and USDOT adopted standards for model year 2017 through 2025 for passenger cars and light-duty trucks. By 2020, vehicles are required to achieve a combined standard of 41.7 mpg and 213 grams of CO_2 per mile. By 2025, vehicles are required to achieve 54.5 mpg (if GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams of CO_2 per mile. According to the USEPA, a model year 2025 vehicle would emit one-half of the GHG emissions from a model year 2010 vehicle (USEPA, 2012). In 2017, the USEPA recommended no change to the GHG standards for light-duty vehicles for model years 2022-2025. In August 2018, the USEPA and NHTSA proposed the Safer Affordable Fuel-Efficient Vehicles Rule that would, if adopted, maintain the CAFE and CO_2 standards applicable in model year 2020 for model years 2021 through 2026. The estimated CAFE and CO_2 standards for model year 2020 are 43.7 mpg and 204 grams of CO_2 per mile for passenger cars and 31.3 mpg and 284 grams of CO_2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. The proposal, if adopted, would also exclude CO_2-equivalent emission improvements associated with air conditioning refrigerants and leakage (and, optionally, offsets for nitrous oxide and methane emissions) after model year 2020 (NHTSA and USEPA, 2018).

Medium- and Heavy-Duty GHG Standards

GHG emissions and fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by the USEPA and the National Highway Traffic Safety Administration (NHTSA). For vocational vehicles, which consist of a variety of work vehicles including dump trucks, the Phase 1 Heavy-Duty Vehicle Greenhouse Gas Regulation started with model year 2014 and the standard requires up to a 10 percent reduction in CO_2 emissions by model year 2017 over the 2010 baseline. The Phase 2 standards start in model year 2021 and require the phase-in of a 12 to 24 percent reduction in CO_2 emission reduction from vocational vehicles by model year 2027 over the 2017 baseline. The USEPA states that the Phase 2 standards reduce oil consumption by up to two billion barrels (84 billion gallons) over the lifetime of the vehicles sold under the program (USEPA 2018).

Energy Independence and Security Act

The Energy Independence and Security Act of 2007 (EISA) facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- Requiring approximately 25 percent greater efficiency for light bulbs by phasing out incandescent light bulbs between 2012 and 2014; requiring approximately 200 percent greater efficiency for light bulbs, or similar energy savings, by 2020; and
- While superseded by the USEPA and NHTSA actions described above, (i) establishing miles per gallon targets for cars and light trucks and (ii) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

Additional provisions of EISA address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of green jobs.[3]

3.6.3.2 State

Executive Order S-3-05, Executive Order B-30-15, and Executive Order B-55-18

In June, 2005, through Executive Order S-3-05, the following GHG emission reduction targets were established:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

In April, 2015, Governor Brown issued Executive Order B-30-15 that:

- Established a new interim statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030.
- Ordered all state agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets.
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

[3] A green job, as defined by the United States Department of Labor, is a job in business that produces goods or provides services that benefit the environment or conserve natural resources.

In September 2018, Governor Brown issued Executive Order B-55-18, which establishes a statewide goal of achieving carbon neutrality as soon as possible and no later than 2045.

California Global Warming Solutions Act of 2006 (Health and Safety Code § 38500 et seq.)

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. In general, CARB is required to adopt rules and regulations directing state actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020.

AB 32 takes into account the relative contribution of each source or source category to protect adverse impacts on small businesses and others by requiring CARB to recommend a *de minimis* (minimal importance) threshold of GHG emissions below which emissions reduction requirements would not apply. AB 32 also allows the Governor to adjust the deadlines mentioned above for individual regulations or the entire state to the earliest feasible date in the event of extraordinary circumstances, catastrophic events, or threat of significant economic harm.

In 2016, the California State Legislature adopted Senate Bill (SB) 32 and its companion bill AB 197, and both were signed by Governor Brown. SB 32 and AB 197 amend HSC Division 25.5, establish a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and include provisions to ensure that the benefits of state climate policies reach into disadvantaged communities.

The Climate Change Scoping Plan was first approved by CARB in 2008. The First Update to the Climate Change Scoping Plan was approved by the Board on May 22, 2014. CARB published the latest 2017 Climate Change Scoping Plan to reflect the 2030 target established in Executive Order B-30-15.

CARB Mandatory Reporting Regulations

Under AB 32, CARB propounded regulations to govern mandatory greenhouse gas emissions reporting for certain sectors of the economy, most dealing with approximately 94 percent of the industrial and commercial stationary sources of emissions. Regulated entities include electricity generating facilities, electricity retail providers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources that emit over 25,000 metric tons of CO_2 from stationary source combustion.

Assembly Bill 1493 (2002) (Health and Safety Code § 43018.5)

AB 1493 required CARB to develop and adopt the nation's first GHG emission standards for automobiles. Not only have litigants challenged their legality in federal court, but also USEPA initially denied California's request for a Clean Air Act waiver to implement its regulations in 2008, but a June 2009 decision overturned the denial. AB 1493 reduces GHG emissions in new passenger vehicles from model year 2012 through 2016 (Phase I) and model years 2017–2025 (Phase II). AB 1493 also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020.

Executive Order S-01-07

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates the following: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and (2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California. In the proposed 2017 Climate Change Scoping Plan Update, CARB's preferred recommendation includes increasing the stringency of the LCFS by reducing the carbon intensity of transportation fuels by 18 percent by 2030, up from the current target of 10 percent by 2020. In April 2017, the LCFS was brought before the Court of Appeal challenging the analysis of potential nitrogen dioxide impacts from biodiesel fuels. The Court directed CARB to conduct an analysis of nitrogen dioxide impacts from biodiesel fuels and froze the carbon intensity targets for diesel and biodiesel fuel provisions at 2017 levels until CARB has completed this analysis. On March 6, 2018, CARB issued its *Draft Supplemental Disclosure Discussion of Oxides of Nitrogen Potentially Caused by the Low Carbon Fuel Standard Regulation*. CARB posted modifications to the amendments on August 13, 2018. Final approval of regulatory changes from CARB's analysis of nitrogen dioxide impacts from biodiesel fuels was made on January 4, 2019.

Senate Bill 375

In September 2008, SB 375 was signed by Governor Schwarzenegger. SB 375 is a comprehensive global warming bill that helps to achieve the goals of AB32. Under SB 375, CARB is required, in consultation with the state's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035. In February 2011, CARB adopted the final GHG emissions reduction targets for the state's Metropolitan Planning Organizations, including the Southern California Association of Governments (SCAG), which is the Metropolitan Planning Organization for the region including both Los Angeles County and Orange County; CARB updated these targets in 2018 (CARB, 2018). Of note, the reduction targets explicitly exclude emission reductions expected from the AB 1493 and the low carbon fuel standard regulations. SB 375 requires MPOs, such as SCAG, to incorporate a "sustainable communities strategy" (SCS) in their regional transportation plans (RTPs) that will achieve GHG emission reduction targets set by CARB. Certain transportation planning and programming activities would then need to be consistent with the RTP/SCS; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS.

Title 24, Part 6, California Code of Regulations

The California Energy Commission first adopted the Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency, and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods.

Title 24, Part 11, California Code of Regulations

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards (CALGreen) Code. The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality" (California Building Standards Commission, 2010). The CALGreen Code was updated in 2016 to include new mandatory measures for residential and nonresidential uses including energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. These new measures took effect on January 1, 2017. The CALGreen code was most recently updated in 2019, with new measures taking effect on January 1, 2020.

Senate Bill 1368

SB 1368 required the California Public Utilities Commission ("PUC") to establish a "GHG emission performance standard" by February 1, 2007, for all electricity providers under its jurisdiction, including the state's three largest privately owned utilities. These utilities provide approximately 30 percent of the state's electric power. After the PUC acted, the California Energy Commission (CEC) adopted a performance standard "consistent with" the PUC performance standard and applied it to local publicly-owned utilities on May 23, 2007 (over one month ahead of its June 30, 2007, deadline). Cal. Pub. Res. Code § 8341(e)(1). However, the California Office of Administrative Law ("OAL") found four alleged flaws in the CEC's rulemaking. The CEC overcame these alleged flaws and adopted reformulating regulations in August 2007.

Senate Bill 1389

Senate Bill 1389 (Public Resources Code Sections 25300–25323; SB 1389) requires the California Energy Commission (CEC) to prepare a biennial integrated energy policy report that assesses 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 (Public Resources Code Section 25301[a]). The 2015 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California including energy efficiency, strategies related to data for improved decisions in the Existing Buildings Energy Efficiency Action Plan, building energy efficiency standards, the impact of drought on California's energy system, achieving 50 percent renewables by 2030, the California Energy Demand Forecast, the Natural Gas Outlook, the Transportation Energy Demand Forecast, Alternative and Renewable Fuel and Vehicle Technology Program benefits updates, update on electricity infrastructure in Southern California, an update on trends in California's sources of crude oil, an update on California's nuclear plants, and other energy issues.

Renewables Portfolio Standard

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 November 2008, Executive Order S-14-08 was signed, which expands the state's Renewables Portfolio Standard (RPS) to 33 percent renewable power by 2020. Pursuant to Executive Order S-21-09, CARB was also preparing regulations to supplement the RPS with a Renewable Energy Standard that would result in a total renewable energy requirement for utilities of 33 percent by 2020. On April 12, 2011, SB X1-2 was signed to increase California's RPS to 33 percent by 2020. SB 350 (Chapter 547, Statues of 2015) further increased the RPS to 50 percent by 2030. The legislation also included interim targets of 40 percent by 2024 and 45 percent by 2027. SB 350 was signed into law on October 7, 2015.

On September 10, 2018, Governor Jerry Brown signed SB 100, which further increased California's Renewables Portfolio Standard and requires retail sellers and local publicly owned electric utilities to procure eligible renewable electricity for 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030, and that CARB should plan for 100 percent eligible renewable energy resources and zero-carbon resources by December 31, 2045.

Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS), established in 2007 through Executive Order S-1-07 and administered by CARB, requires producers of petroleum-based fuels to reduce the carbon intensity of their products, starting with 0.25 percent in 2011 and culminating in a 10-percent total reduction in 2020. Petroleum importers, refiners and wholesalers can either develop their own low carbon fuel products, or buy LCFS credits from other companies that develop and sell low carbon alternative fuels, such as biofuels, electricity, natural gas and hydrogen.

California Air Resource Board Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

In 2004, the CARB adopted an Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling in order to reduce public exposure to diesel particulate matter emissions (Title 13 California Code of Regulations [CCR] Section 2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than five minutes at any given location. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling.

California Air Resource Board Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and other Criteria Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles

In addition to limiting exhaust from idling trucks, CARB also promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower (hp) such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. The In-Use Off-Road Diesel-Fueled Fleets regulation adopted by CARB on July 26, 2007, aims to reduce emissions by installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with newer emission-controlled models (13 CCR Section 2449). The compliance schedule requires full implementation by 2023 in all equipment for large and medium fleets and by 2028 for small fleets. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation has shown an increase in energy savings in the form of reduced fuel consumption from more fuel-efficient engines.

California Air Resource Board Cap-and-Trade Regulation

The California Air Resource Board has implemented a cap-and-trade type program, pursuant to the AB-32 directed Scoping Plan, applicable to specific industries that emit more than 25,000 MTCO2e. The AB 32 Scoping Plan identifies a Cap-and-Trade program as one of the strategies California will employ to reduce the greenhouse gas (GHG) emissions that cause climate change. Under Cap-and-Trade, an overall limit on GHG emissions from capped sectors will be established by the Cap-and-Trade program and facilities subject to the cap will be able to trade permits (allowances) to emit GHGs. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions for GHG emissions from stationary sources. The petroleum and natural gas systems sector is covered starting in 2013 for stationary and related combustion, process vents and flare emissions if the total emissions from these sources exceed 25,000 MTCO2e per year. Suppliers of natural gas and transportation fuels are covered beginning in 2015 for combustion emissions from the total volume of natural gas delivered to non-covered entity or for transportation fuels.

Cap-and-Trade is designed to reduce the emissions from a substantial percentage of GHG sources (about 80% of GHG emissions will come under the program) within California through a market trading system. The system would reduce GHG emissions by reducing the available GHG "allowances" over time up until the year 2020. The program beyond the year 2020 has not been designed yet, but the program is intended to extend beyond that timeframe through 2030. Facilities are required to obtain an "allowance", either through purchasing on auction or through freely allocated "industry assistance" allowances from CARB, for each MTCO2e of GHG they emit. CARB issues the "industry assistance" allocations for free for a number of industries. These are based, in part, on a pre-defined "benchmark" of GHG emissions per unit of production.

For the oil recovery production sector, allowances are provided as a function of the amount of crude oil produced, thereby establishing, in effect, a level of efficiency in regards to GHG emissions for that sector. Other sectors are also allocated allowances based on their own respective activities. If an operation within the sector operates less efficiently than the specified

"benchmark", thereby receiving an insufficient number of "free" allowances to cover their emissions, they would be required to implement efficiency improvements or purchase additional allowances from the CARB auction. Some availability of "offsets" is also included in the program which can be obtained from specific, allowable offset programs, such as GHG reduction projects related to forestry, livestock and ozone depleting chemicals. Offsets outside of these three options are not allowed at this time. The first group of sectors began trading in allowances in 2012. That group includes the oil and gas sector as well as most stationary sources. Compliance obligation began for distributers of transportation fuels, natural gas and other fuels in 2015. Under Cap-and-Trade program, an overall limit is established for GHG emissions from capped sectors (e.g., electricity generation) and declines over time, and facilities subject to the cap can trade permits to emit GHGs. The statewide cap for GHG emissions from the capped sectors commenced in 2013 and declines over time, achieving GHG emission reductions throughout the Program's duration and on July 17, 2017, the California legislature passed Assembly Bill 398, extending the Cap-and-Trade program through 2030.

2017 Climate Change Scoping Plan Update

CARB adopted the 2017 Climate Change Scoping Plan at a public meeting held in December 2017 (CARB, 2017b). The 2017 Scoping Plan outlines the strategies the state will implement to achieve the 2030 GHG reduction target of 40 percent below 1990 levels by 2030 established by SB 32. The 2017 Scoping Plan is also intended to "substantially advance" toward the EO S-3-05 2050 climate goal to reduce GHG emissions by 80 percent below 1990 levels by 2050.

The 2017 Scoping Plan builds on the Cap-and-Trade Regulation, the Low Carbon Fuel Standard (LCFS), improved vehicle, truck and freight movement emissions standards, increasing renewable energy, and strategies to reduce methane emissions from agricultural and other wastes by using it to meet our energy needs. The 2017 Scoping Plan also comprehensively addresses GHG emissions from natural and working lands of California, including the agriculture and forestry sectors. The 2017 Scoping Plan considered a number of different alternatives to achieve the 2030 GHG reduction goal. The "Scoping Plan Scenario" was ultimately adopted and relies on the continuation of ongoing and statutorily required programs and continuation of the Cap-and-Trade Program. The Scoping Plan Scenario was modified from the January 2017 Proposed Scoping Plan to reflect AB 398, including removal of the 20 percent GHG reduction measure for refineries (CARB, 2017b).

CARB states that the Scoping Plan Scenario "is the best choice to achieve the state's climate and clean air goals" (CARB, 2017b). Under the Scoping Plan Scenario, the majority of the reductions would result from continuation of the Cap-and-Trade regulation. Additional reductions are achieved from electricity sector standards (i.e., utility providers to supply 50 percent renewable electricity by 2030), doubling the energy efficiency savings at end uses, additional reductions from the LCFS, implementing the short-lived climate pollutant strategy (e.g., hydrofluorocarbons), and implementing the mobile source strategy and sustainable freight action plan.

3.6.3.3 Regional

South Coast Air Quality Management District

The program area is located in the South Coast Air Basin (Air Basin), which consists of Orange County, Los Angeles County (excluding the Antelope Valley portion), and the western, non-desert portions of San Bernardino and Riverside Counties, in addition to the San Gorgonio Pass area in Riverside County. The South Coast Air Quality Management District (SCAQMD) is responsible for air quality planning in the Air Basin and developing rules and regulations to bring the area into attainment of the ambient air quality standards. This is accomplished through air quality monitoring, evaluation, education, implementation of control measures to reduce emissions from stationary sources, permitting and inspection of pollution sources, enforcement of air quality regulations, and by supporting and implementing measures to reduce emissions from motor vehicles.

In 2008, SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds (CARB, 2008). On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for stationary source/industrial projects where the SCAQMD is Lead Agency. A GHG Significance Threshold Working Group was formed to further evaluate potential GHG significance thresholds (SCAQMD, 2008). The aforementioned Working Group has been inactive since 2011 and the SCAQMD has not formally adopted any GHG significance threshold.

3.6.3.4 Local

City of Seal Beach

The City of Seal Beach General Plan, adopted in December 2003, does not contain a stand-alone air quality element or a Climate Action Plan.

City of Long Beach

The City of Long Beach adopted an "Air Quality Element," (adopted December 3, 1996). The Element does not contain specific control strategies for greenhouse gases except a policy to support reduced energy consumption through conservation improvements that would reduce greenhouse gas emissions (Policy 7.1.7).

The City of Long Beach is in the process of developing a Climate Action and Adaptation Plan (CAAP). The City released a working draft of the CAAP on May 31, 2019. The CAAP will be incorporated into the City of Long Beach General Plan as a mitigation measure to the Land Use Element. The CAAP goals include:

- Distinguish Long Beach as a leader in climate mitigation and adaptation planning
- Be inclusive of the entire community while prioritizing vulnerable and disproportionately impacted populations
- Create a healthier community by addressing climate change
- Consider social, environmental, and economic co-benefits holistically

- Empower young people to be leaders in creating a most sustainable community
- Invoke personal sense of responsibility among residents and businesses
- Be an actionable plan (right balance of innovation and practicality)

It is anticipated that the CAAP will be adopted by City Council by the Fall of 2019 (http://www.longbeach.gov/lbds/planning/caap/).

3.6.4 Significance Thresholds and Methodology

3.6.4.1 Significance Thresholds

For the purposes of this Program Environmental Impact Report (PEIR) and consistency with Appendix G of the CEQA Guidelines, the proposed program would have a significant impact on greenhouse gas emissions if it would:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The proposed program would have a significant impact on energy if it would:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

On December 5, 2008, the SCAQMD adopted an interim GHG significance threshold for projects where the SCAQMD is lead agency. The threshold utilizes a tiered approach, with a screening significance threshold of 10,000 $MTCO_2e$ per year for industrial projects. Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. Tier 2 consists of determining whether or not the project is consistent with a GHG reduction plan. If the proposed project is consistent with the qualifying local GHG reduction plan, it is not significant for GHG emissions. If the project is not consistent with a local GHG reduction plan, there is no approved plan, or the GHG reduction plan does not consist of all the required components, then the project would move to Tier 3. Tier 3 establishes a screening significance threshold level that is intended to have a 90 percent emission capture rate approach. If the project exceeds the GHG screening significance threshold level and GHG emissions cannot be mitigated to less than the screening level, the project would move to Tier 4. Tier 4 is a decision tree approach to achieve compliance, but is not recommended for approval by SCAQMD. Tier 5 requires the project proponent to implement off-site mitigation to reduce GHG emission impacts to below the proposed screening level. For this proposed program, the most appropriate threshold to use is the 10,000 $MTCO_2e$ per year because it is a program level evaluation of a wetlands restoration program with eventual phasing out of oil fields and oil operation infrastructure. The SCAQMD's working group is currently inactive and has not set a date for finalizing these recommendations.

3.6.4.2 Methodology

Greenhouse Gas Emissions

Existing Site

For the purposes of this program-level analysis, it is conservatively assumed that the program activities would result in all net new emissions. Most of the program area is either vacant or an active oil field. Existing emissions from oil fields within the boundaries of the Los Cerritos Wetlands Oil Consolidation and Restoration Project, located in the northern portion of the program area, have already been addressed in a previously certified EIR. As the program activities would restore habitats and eventually decommission and phasing out existing oil operations, the net change for emissions in the long term could be negative. However, this cannot be accurately quantified at this program-level since the timing and commitments to cease oil operations in the future is unknown. As a conservative approach, no existing emissions were subtracted from estimated program emissions before comparison to emission thresholds.

Construction

GHG emissions have been quantified using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 software, an emissions inventory software, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professions to quantify potential criteria pollutant and GHG emissions from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying GHG emissions from land use projects throughout California and is recommended by the SCAQMD. For on-road vehicle emissions, CalEEMod uses the emission factors and fleet mix based on the CARB on-road vehicle emissions model (EMFAC), which is incorporated into CalEEMod. On-road vehicle emission factors from the USEPA-approved EMFAC2017 model were used for the analysis. It is assumed that a tugboat would be used to pull the barges for soil transport and that there would be two crew/survey boats at most on any given day. Tugboat and crew/survey boat emissions were calculated using emission factors from USEPA marine engine rules for Tier 2 engines.

The input values used in this analysis were adjusted to account for the nature of wetlands restoration activities and referenced the equipment and assumptions used for the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR (State Clearinghouse Number 2016041083) for consistency (Table 3 of the Greenhouse Gas Emissions Technical Report). Specialized construction equipment was added as appropriate according to the activities listed in Chapter 2, *Project Description*, of this PEIR. Construction is phased by location (South, Isthmus, Central, and North Areas) and by time (Near-Term, Mid-Term, and Long-Term). In order to calculate a conservative emissions estimate and because the sequence of restoration is uncertain, a worst-case year in the Near-Term (2020) was formulated. Emission factors decline in later years because of the requirement and development of cleaner and more efficient equipment. Maximum daily GHG emissions were calculated by subphase using CalEEMod and then multiplied by a

conservatively estimated maximum total number of days for that construction subphase to obtain an estimated total construction GHG emissions for the entire program restoration activities. Construction activities and schedule are discussed in further detail in the Greenhouse Gas Emissions Technical Report. Modeling input and output files provided in Appendix A of the Greenhouse Gas Emissions Technical Report, provided in Appendix F, of the PEIR.

Operation

Similar to construction, GHG emissions have been quantified using CalEEMod version 2016.3.2. CalEEMod was used to forecast the annual emissions from mobile sources that would occur during long-term program operations. The operational year was set to 2021 for a conservative emissions estimate. This consists mostly of truck trips for maintenance of the trails and wetlands and emissions from passenger vehicles from visitors. The analysis relied on the Institute of Transportation Engineers (ITE) Manual, 10th Edition "Public Park" category trip rates (i.e., denoted in the ITE Manual as "Land Use [LU] 411").

Area source emissions are based on natural gas (building heating and water heaters), landscaping equipment, and consumer product usage (including paints) rates provided in CalEEMod for the visitor center building. Most of the emissions would be associated with passenger cars traveling to and from the visitor center. Painting and re-painting of this facility will contribute to emissions. Additional emissions will come from maintenance of the wetlands and trails.

Operational GHG impacts are presented as net new emissions and added to amortized construction emissions. Modeling input and output files are provided in Appendix A of Greenhouse Gas Emissions Technical Report, provided in Appendix F, of the PEIR.

The proposed program's GHG emissions are also evaluated by assessing consistency with applicable GHG reduction strategies. As discussed previously, the GHG regulations have been adopted primarily at the federal and state levels to reduce emissions of GHGs from program sources, such as trucks and energy, under the Clean Air Act and the state's GHG regulatory framework under HSC Division 25.5 (AB 32). In addition, the SCAG 2016 RTP/SCS outlines goals for improving air quality and encouraging active transportation to reduce per capita vehicle miles traveled and associated transportation GHG emissions. Impacts are evaluated based on consistency with these applicable GHG regulations and plans.

Energy

Existing Site

For the purposes of this program-level analysis, it is conservatively assumed that the program activities would result in all net new energy demand. Most of the program area is either vacant or an active oil field. Existing energy demand from oil fields within the boundaries of the Los Cerritos Wetlands Oil Consolidation and Restoration Project, located in the northern portion of the program area, have already been addressed in a previously certified EIR. As the proposed program activities would restore habitats and eventually decommission and phase out existing oil operations, the net change for energy demand in the long term could be negative. However, this cannot be accurately quantified at this program-level since the timing and commitments to cease

oil operations in the future is unknown. As a conservative approach, existing energy emissions was not subtracted from estimated program energy demand in the quantitative analysis.

Construction

Construction of the proposed program would result in energy demand as a result of the use of heavy-duty construction equipment, on-road trucks, and workers commuting to and from the program area. The assumption that diesel fuel would be used for all equipment represents the most conservative scenario for maximum potential energy use during construction. Energy demand from heavy-duty construction equipment is estimated based on the equipment analyzed in the California Emissions Estimator Model (CalEEMod), consistent with the air quality analysis in the proposed program's Air Quality Technical Report and Greenhouse Gas Emissions Technical Report. For on-road vehicle energy demand, on-road vehicle fuel demand factors were obtained from the USEPA-approved EMFAC2017. It is assumed that a tugboat would be used to pull the barges for soil transport and that there would be two crew/survey boats at most on any given day. Tugboat and crew/survey boat energy demand were calculated based on USEPA marine engine rules for Tier 2 engines, similar to the GHG emissions estimate, and the carbon content in a gallon of diesel fuel. Detailed energy calculations can be found in Appendix G. Construction activities, including the construction of new buildings and hardscape, typically do not involve the consumption of natural gas. Accordingly, natural gas would not be needed to support program construction activities, and no natural gas demand would be generated by construction of the proposed program.

Operation

Energy would be required in the form of electricity and natural gas for operation of the visitor center. The energy usage takes into account building energy standards pursuant to the Title 24 Building Standards Code and CALGreen Code. Energy for transportation would include fuel used for employee and visitor trips to the program area. The estimated fuel economy for vehicles is based on fuel consumption factors from the CARB EMission FACtors model (EMFAC2017). It is assumed that the wetland itself would not require any imported water or associated energy for water pumping and conveyance (the Visitor's Center would require potable water). Detailed energy calculations can be found in Appendix G.

As stated in Chapter 1, *Introduction*, on March 8, 2019, the Los Cerritos Wetlands Authority sent a Notice of Preparation to responsible, trustee, and federal agencies, as well as to organizations, and individuals potentially interested in the proposed program to identify the relevant environmental issues that should be addressed in the PEIR. Issues related to greenhouse gas emissions were identified.

3.6.5 Program Impacts and Mitigation Measures

Impact GHG-1: The proposed program would result in a significant impact if the proposed program would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Construction

Construction of the proposed program would generate GHG emissions from multiple sources (**Table 3.6-3**, *Program Construction GHG Emissions*). GHG emissions would be generated from tailpipe emissions of heavy duty construction equipment and mobile trips for maintenance. The proposed program would require special equipment such as low ground pressure equipment, mats, long reach excavators, clamshell and dragline crane, amphibious excavator, rotary ditcher, floating equipment, and a hydraulic dredge. Complete equipment lists are shown in Table 3 of the Greenhouse Gas Emissions Technical Report.

TABLE 3.6-3
PROGRAM CONSTRUCTION GHG EMISSIONS

Construction Subphase	Total Program $MTCO_2e$
Demolition/Site Preparation	3,426
Grading/Excavation	22,191
Drainage/Utilities/Subgrade	2,682
Building Construction	379
Paving	86
Architectural Coating	6
Total	*28,772*
Amortized over 30 years ($MTCO_2e$/year)	959

SOURCE: Appendix A, Greenhouse Gas Emissions Technical Report, ESA, 2019.

Operation

Operational emissions would be generated at the visitor center by electric consumption for lighting and natural gas consumption for space heating. In addition, there would be emissions from motor vehicles traveling to and from the visitor center and other trailheads. A minimal amount of emissions is anticipated for periodic maintenance activities. It is anticipated that no water would be pumped into the wetland so the only water use would be to serve the visitor center. Annual operational emissions were calculated using CalEEMod and shown in **Table 3.6-4**, *Program Operational GHG Emissions*. Emissions were then compared to the SCAQMD GHG threshold of 10,000 $MTCO_2e$/year for industrial projects. The program annual emissions would be below the 10,000 $MTCO_2e$/year threshold. Because CalEEMod has a default assumption of 0 $MTCO_2$/acre for the wetland land use category, no carbon sequestration from the increase in wetland vegetation is incorporated into the GHG emissions analysis. Impacts from the program GHG emissions would be less than significant and mitigation measures would not be required.

TABLE 3.6-4
PROGRAM OPERATIONAL GHG EMISSIONS

Phase	Program $MTCO_2e$/year
Area	<0.1
Energy	9.43
Mobile	464.88
Waste	17.02
Water	2.19
Operational Total	*493.5*
Amortized over 30 years ($MTCO_2e$/year)	959
Total	**1,453**

SOURCE: Appendix A, Greenhouse Gas Emissions Technical Report, ESA, 2019.

Mitigation Measure

No mitigation is required.

Significance after Mitigation

Less than Significant

Impact GHG-2: The proposed program would result in a significant impact if the proposed program would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Construction

The proposed program would utilize construction contractors that would be in compliance with regulations including the USEPA Heavy Duty Vehicle Greenhouse Gas Regulation and the CARB ACTM that limits heavy-duty diesel motor vehicle idling. For vocational vehicles, which consist of a variety of work vehicles including dump trucks, the Phase 1 Heavy-Duty Vehicle Greenhouse Gas Regulation requires up to a 10 percent reduction in CO_2 emissions by model year 2017 over the 2010 baseline. The Phase 2 standards require the phase-in of a 12 to 24 percent reduction in CO_2 emission reduction from vocational vehicles by model year 2027 over the 2017 baseline. Compliance with anti-idling provisions would minimize unnecessary GHG emissions. Implementation of these measures would ensure that GHG-efficient equipment and practices in accordance with applicable plans, policies, and regulations would be used. Therefore, the proposed program would not conflict with applicable regulations to reduce GHG emissions and construction impacts would be less than significant.

Operation

GHG emissions associated with mobile sources would only occur from periodic vehicle trips by workers for inspection and maintenance purposes and recreational visitors accessing the program

area, which would not generate substantial emissions. Nonetheless, workers and visitors to the program area would utilize vehicles that comply with state motor vehicle emissions standards.

The Seal Beach visitor center and any other new facilities would be built to the CALGREEN standards, which would reduce water consumption, improve energy efficiency, and decrease waste. The proposed program would be compliant to all state and city codes and regulatory requirements. As of June 2019, the City of Seal Beach and City of Long Beach do not have any certified GHG-related policies, plans, or regulations. The City of Long Beach CAAP is expected to be certified by City Council in the Fall of 2019. The CAAP will serve as a guidance document for future climate change planning for the City of Long Beach and address both mitigation and adaptation. The proposed program is expected to align with these strategies since its design considered sea level rise to adapt to a warming climate.

While the proposed program is not a transportation project or a residential, commercial, or mixed-use project that would generate substantial numbers of vehicle trips, the proposed program would contribute to the non-automotive transportation network for both the City of Seal Beach and City of Long Beach. The proposed program would provide improved public access to the wetlands both on foot and by bicycle within a populated urban area in the City of Seal Beach and the City of Long Beach that would be accessible to local area residents, employees, and visitors. These recreational opportunities for City of Seal Beach and City of Long Beach residents, employees, and visitors would reduce transportation-related air pollutants and GHG emissions by providing nearby recreational amenities including visitor centers and trails. Therefore, the proposed program would not conflict with the SCAG 2016 RTP/SCS goals of improving air quality, increasing accessibility to natural areas, preserving open space, and encouraging active transportation (e.g., bicycling and walking).

Therefore, impacts from the proposed program's GHG emissions would be less than significant with regard to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Mitigation Measure

No mitigation is required.

Significance after Mitigation

Less than Significant

Impact EN-1: The proposed program would result in a significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during program construction or operation.

Construction

Construction of the proposed program would result in energy consumption from the use of heavy-duty construction equipment, on-road trucks, and workers commuting to and from the program area. Energy demand from heavy-duty construction equipment is estimated based on the

equipment analyzed in CalEEMod, consistent with the proposed program's air quality and GHG emissions assessment. The conservatively estimated total and annual average construction energy demand (i.e., total diesel and gasoline fuel) for heavy-duty construction equipment and construction worker vehicle trips are shown in **Table 3.6-5**, *Program Construction Fuel Usage*.

TABLE 3.6-5
PROGRAM CONSTRUCTION FUEL USAGE

Source	Total Gallons of Diesel Fuel	Total Gallons of Gasoline Fuel
Construction:		
Heavy-Duty Construction Equipment	2,977,544	—
Tugboats and Crew/Survey Boats	2,213,058	—
Haul Trucks	65,909	—
Vendor Trucks	4,762	—
Worker Trips	—	127,191
Total (over the approximately 22-year construction duration)	**5,261,273**	**127,191**
Annual Average (over the approximately 22-year construction duration)	**239,149**	**5,781**

SOURCE: ESA 2019

For comparison purposes, the proposed program's construction energy demand from transportation fuel is compared to the Los Angeles County transportation fuel sales. As shown in **Table 3.6-6**, *Comparison of Project Construction and County Fuel Usage*, the conservatively estimated construction energy demand for the proposed program would represent a very small fraction of the County's total fuel consumption. Actual construction energy demand is likely to be lower than the values shown in Table 3.6-6 as construction of the proposed program would be intermittent and variable over the near-, mid-, and long- term depending on the construction schedule, volume of construction activities, and specific location of such activity across the 503-acre program area. Program construction trucks would be required to comply with fuel saving regulations such as the USEPA Phase 2 standards, which affect model year 2021 through model year 2027 medium- and heavy-duty trucks. According to the USEPA, the Phase 2 standards would reduce oil consumption by up to two billion barrels (84 billion gallons) over the lifetime of the vehicles sold under the program (USEPA 2018), and a portion of the fuel savings would be from those model year 2017 through 2027 medium- and heavy-duty trucks used for the proposed program. Program construction trucks would also be required to comply with the CARB Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (Title 13 California Code of Regulations [CCR] Section 2485) as applicable. This measure does not allow diesel-fueled commercial vehicles to idle for more than five minutes at any given location (unless specifically exempted from the regulation[4]). While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling. As such, the proposed

[4] For instance, the regulation exempts concrete pouring trucks where idling is a necessary function of the equipment.

program would result in a less than significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during program construction.

TABLE 3.6-6
COMPARISON OF PROGRAM CONSTRUCTION AND COUNTY FUEL USAGE

Source	Gallons of Diesel Fuel	Gallons of Gasoline Fuel
Los Angeles County (in 2017)[a]	590,196,078	3,659,000,000
Orange County (in 2017)[a]	119,607,843	1,382,000,000
Annual Program Construction	239,149	5,781
Percent of Los Angeles County	0.041%	0.0002%
Percent of Orange County	0.200%	0.0004%

[a] California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2017. Available at: https://www.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed February 2019. Diesel is adjusted to account for retail (51%) and non-retail (49%) diesel sales.

SOURCE: ESA 2019.

Operation

Operational energy consumption would occur as a result of building energy needs for the visitor center and the use of transportation fuels (e.g., diesel and gasoline) from vehicles traveling to and from the program area. Daily operation of the proposed program would consume energy in the form of electricity and natural gas. Additionally, a minimal amount of energy would be consumed for the conveyance and treatment of water, wastewater, and the disposal of solid waste off-site to service the visitor center. Building energy use factors and water demand factors from CalEEMod, consistent with the proposed program analyses conducted for air quality and GHG emissions, are used to estimate building energy use. The wetland would not require imported water. The proposed program's estimated net operational electricity demand, including from water demand, is provided in **Table 3.6-7**, *Program Operational Electricity Usage*. As previously discussed, the proposed program's electricity consumption would have no impact on SCE's electricity generation.

TABLE 3.6-7
PROGRAM OPERATIONAL ELECTRICITY USAGE

Source	Electricity per Year (million kWh)
SCE Electricity Sales (2017)[a]	85,879
Program Operations:	
Building Electricity[b]	0.026
Water Electricity[c]	0.006
Program Net Total	**0.032**

[a] CEC, 2017b.

[b] Electricity is calculated in the proposed program's Greenhouse Gas Emissions Technical Report (ESA 2019) using CalEEMod (includes water-related electricity for conveyance and treatment).

[c] Electricity for water supply, treatment, distribution, and wastewater treatment.

SOURCE: ESA 2019

The proposed project's estimated net operational natural gas demand is provided in **Table 3.6-8**, *Program Operational Natural Gas Usage*. Operation of the proposed program would use a minimal amount of energy, not increase the need for new energy infrastructure, and not cause a wasteful, inefficient, and unnecessary consumption of energy. Therefore, operational energy impacts would be less than significant.

TABLE 3.6-8
PROGRAM OPERATIONAL NATURAL GAS USAGE

Source	Natural Gas per Year (million kBtu)
SoCalGas Natural Gas Sales (2017)[a]	913,960
Program Operations[b]	0.02
Percent of SoCalGas	0.000002%
Program Net Total	**0.032**

[a] California Gas and Electric Utilities, 2018~~b~~.

[b] Natural gas is calculated in the proposed program's Greenhouse Gas Emissions Technical Report (ESA 2019) using CalEEMod.

SOURCE: ESA 2019

Operation of the proposed program would result in transportation energy use by visitors and employees coming and going to the program area. The proposed program's estimated operational transportation fuel demand is provided in **Table 3.6-9**, *Program Operational Fuel Usage*.

TABLE 3.6-9
PROGRAM OPERATIONAL FUEL USAGE

Source	Gallons of Diesel Fuel per Year	Gallons of Gasoline Fuel per Year
Los Angeles County (2017)[a]	590,196,078	3,659,000,000
Orange County (in 2017)[a]	119,607,843	1,382,000,000
Program Operations	8,514	46,964
Percent of Los Angeles County	0.001%	0.001%
Percent of Orange County	0.007%	0.003%

[a] California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2017. Available at: https://www.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed February 2019. Diesel is adjusted to account for retail (51%) and non-retail (49%) diesel sales.

SOURCE: ESA 2019.

As shown above, operation of the proposed program would result in energy demand from building energy usage and transportation-related energy associated with vehicles traveling to and from the program area. The amount of energy used would not represent a substantial fraction of the available energy supply in terms of building energy or transportation fuels and would not increase the need for new energy infrastructure. The program area is surrounded by urban developed uses such that visitors to the program area would not need to travel long distances thus minimizing VMT. Furthermore, as discussed in the GHG analysis, while the proposed program is not a transportation project or a residential, commercial, or mixed-use project that would generate substantial numbers of vehicle trips, the proposed program would provide improved public access

to the wetlands both on foot and by bicycle within a populated urban area in the City of Seal Beach and the City of Long Beach that would be accessible to local area residents, employees, and visitors. These recreational opportunities for the City of Seal Beach and the City of Long Beach residents, employees, and visitors would reduce transportation-related fuel demand by providing nearby recreational amenities including visitor centers and trails. The proposed program would incorporate green building measures consistent with energy efficiency standards in city policy and CALGreen. Therefore, operation of the proposed program would not result in the wasteful, inefficient, and unnecessary consumption of building energy or transportation energy usage and operational energy impacts would be less than significant.

Mitigation Measure

No mitigation is required.

Significance after Mitigation

Less than Significant

Impact EN-2: The proposed program would result in a significant impact if the proposed program would conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The proposed program would be consistent with energy efficiency standards in the City of Seal Beach municipal code, City of Long Beach municipal code, and CALGreen Code. The City of Seal Beach, where the visitor center is to be located, does not have a specific, local plan or policy for energy efficiency or renewable energy. Nonetheless, the proposed program would provide recreational opportunities for City of Seal Beach and City of Long Beach residents, employees, and visitors that would reduce transportation-related fuel demand by providing nearby recreational amenities including visitor centers and trails. The proposed program would not conflict with the SCAG 2016 RTP/SCS general goals and strategies of increasing accessibility to natural areas, preserving open space, and encouraging active transportation (e.g., bicycling and walking) thereby minimizing transportation fuel demand. As the proposed program is to restore a wetland and has a small building footprint of 2,000-square-foot for a visitor center, the proposed program would use minimal energy and have a less than significant impact with regard to conflicting with or obstructing a state or local plan for renewable energy or energy efficiency. Impacts would be less than significant.

Mitigation Measure

No mitigation is required.

Significance after Mitigation

Less than Significant

3.6.6 Cumulative Impacts

3.6.6.1 Greenhouse Gas Emissions

The emissions of a single project will not cause or exacerbate global climate change. Climate change is a global phenomenon and the significance of a project's GHG emissions is inherently cumulative in nature. CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs from even relatively small (on a global basis) increases in GHG emissions. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and therefore significant. A cumulatively considerable impact is the impact of a proposed program in addition to impacts of the related projects. However, in the case of global climate change, the proximity of the proposed program to other GHG-generating activities is not directly relevant to the determination of global GHG cumulative impacts.

As shown in Table 3.6-4, the proposed program would not exceed the SCAQMD screening level threshold of 10,000 $MTCO_2e$/year. The proposed program would be consistent with the goals in the SCAG 2016 RTP/SCS, USEPA Heavy Duty Vehicle Greenhouse Gas Regulation, the CARB ACTM, and CALGREEN. Because GHG emissions are considered cumulative in nature, the proposed program would not result in GHG emissions that are cumulatively considerable.

3.6.6.2 Energy

Future development would result in the irreversible use of electricity and natural gas resources that could limit future energy availability. However, the use of such resources would be minor compared to existing supply and infrastructure within the SCE and SoCalGas service area and would be consistent with growth expectations. The proposed program would have a relatively small footprint with the majority of land set aside for wetland restoration and a 2,000-square-foot visitor center. Accordingly, the impacts related to electricity and natural gas consumption would not be cumulatively considerable, and thus would be less than significant. Likewise, the demand for transportation energy would be driven by mobile trips from visitors and employees. As the proposed program's impact to transportation energy would be considered less than significant, the proposed program's cumulative impact to transportation energy would also be less than significant.

3.6.7 References

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