

3.7 GREENHOUSE GAS EMISSIONS

This section describes the impacts related to greenhouse gas (GHG) emissions that would result from implementation of the Project. Included is a review of existing conditions, a summary of applicable policies and regulations related to GHG emissions, and analysis of environmental impacts of the Project. Where applicable, mitigation measures are included for potentially significant impacts, where feasible.

SUMMARY OF IMPACTS

The Project would exceed SCAQMD's draft interim thresholds and, therefore, the Project would generate GHG emissions that may have a significant impact on the environment. Even with implementation of Mitigation Measures GHG-1, the Project would be considered significant and unavoidable.

The Project could conflict with applicable plans, policies, or regulations adopted for reducing GHG emissions. However, with implementation of Mitigation Measures AQ-1, AQ-2, AQ-3, and GHG-1, the impacts would be reduced to less than significant with mitigation.

The residential component of the ORCC Specific Plan Project were considered within the emissions calculations and consistency analysis of this Project. Specific impact findings associated with the development of the ORCC Specific Plan Project are being evaluated in a standalone EIR.

3.7.1 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.

Greenhouse Gases

Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF₃), and sulfur hexafluoride (SF₆). Primary GHGs attributed to global climate change are discussed in the following subsections.

Carbon Dioxide. CO₂ is a colorless, odorless gas. CO₂ is emitted in a number of ways, both naturally and through human activities. The largest source of CO₂ 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



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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 CO₂ emissions. The atmospheric lifetime of CO₂ is variable because it is so readily exchanged in the atmosphere (USEPA 2023a).

Methane. CH₄ is a colorless, odorless gas, and 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. CH₄ 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. The atmospheric lifetime of CH₄ is about 12 years (USEPA 2023a).

Nitrous Oxide. N₂O is a clear, colorless gas with a slightly sweet odor. N₂O is produced by both natural and human-related sources. Primary human-related sources of N₂O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N₂O 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 N₂O is approximately 120 years (USEPA 2023a).

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) (USEPA 2023a).

Perfluorocarbons. PFCs are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF₄), perfluoroethane (C₂F₆), perfluoropropane (C₃F₈), perfluorobutane (C₄F₁₀), perfluorocyclobutane (C₄F₈), perfluoropentane (C₅F₁₂), and perfluorohexane (C₆F₁₄). 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 CF₄ and C₂F₆ as byproducts. The estimated atmospheric lifetimes for CF₄ and C₂F₆ are 50,000 and 10,000 years, respectively (USEPA 2023a).

Nitrogen Trifluoride. NF₃ is an inorganic, colorless, odorless, toxic, nonflammable gas used as an etchant in microelectronics. NF₃ 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. In 2009, NF₃ was listed by California as a potential GHG to be listed and regulated under AB 32 (Section 38505 HSC).

Sulfur Hexafluoride. SF₆ is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF₆ is primarily used as an electrical insulator in high voltage equipment. The electric



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power industry uses roughly 80percent of all SF₆ produced worldwide. Leaks of SF₆ occur from aging equipment and during equipment maintenance and servicing. SF₆ has an atmospheric life of 3,200 years (USEPA 2023b).

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, including programs that target reducing PM from diesel engines and burning activities (CARB 2013).

Global Warming Potential

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 carbon dioxide equivalents (CO₂e), which weigh each gas by its global warming potential (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 CO₂ were being emitted. Based on a 100-year time horizon, Methane traps over 25 times more heat per molecule than CO₂, and N₂O absorbs roughly 298 times more heat per molecule than CO₂. Additional GHGs with high GWP include NF₃, SF₆, PFCs, and black carbon.

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.

United States of America

In 2022, net GHG emissions in the United States totaled 5,489 MMTCO₂e, an increase of one percent when compared to 2021 emissions. Within the United States, the largest contributor to GHG emissions is the transportation sector (28 percent). The next largest contributors are from electricity production (25 percent) and industry (23 percent), followed by the commercial and residential sector (13 percent) and the agricultural sector (10 percent). Transportation emissions primarily come from burning fossil fuels for cars, trucks, ships, trains, and planes. Over 90 percent of the fuel used for transportation is petroleum-based, which includes primarily gasoline and diesel. The bulk of emissions generated from energy production come from burning fossil fuels, mostly coal and natural gas. Industry emissions are also primarily



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generated from fossil fuels burned for heat, the use of certain products that contain GHGs, and the handling of waste. Similar to industry sector emissions, commercial and residential uses arise primarily from fossil fuels for heat, the use of certain products that contain GHGs, and the handling of waste. Agricultural emissions come from livestock such as cows, agricultural soil, and rice production. The land use and forestry sector within the U.S. serves as a carbon sink. Carbon sinks absorb CO₂ from the atmosphere. Land areas across the U.S. absorbed approximately 12 percent of the 2021 GHG emissions (USEPA 2024).

California

In 2022, GHG emissions within California totaled 371.1 MMTCO₂e. Similar to national emissions, in California, the transportation sector is the largest contributor. Transportation emissions account for approximately 39 percent of the total statewide GHG emissions. The majority of transportation emissions are derived from passenger vehicles and heavy-duty trucks. Emissions associated with industrial uses are the second largest contributor, totaling roughly 23 percent. Industrial emissions are driven by fuel combustion from sources that include refineries, oil and gas extraction, cement plants, and the portion of cogeneration emissions attribution to thermal energy output. Electricity generation (in-state and imports) totaled roughly 16 percent. Other GHG sources include agriculture (8 percent), residential (8 percent), and commercial (6 percent) (CARB 2024c).

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 snowpack 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. 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.



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3.7.2 Regulatory Setting

There are considerable regulatory actions regarding GHGs and climate change at the state and local level. The following includes the key state and regional regulations applicable to the Project.

State

Assembly Bill 32 and Senate Bill 32

AB 32 (2006) requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. GHGs, as defined under AB 32, include CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. Since AB 32 was enacted, a seventh chemical, NF₃, has also been added to the list of GHGs. CARB is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

CARB approved the 1990 GHG emissions level of 427 MMTCO₂e on December 6, 2007. Therefore, to meet the state's target, emissions generated in California in 2020 are required to be equal to or less than 427 MMTCO₂e. In order to set a framework for the state to meet this target, CARB was tasked with creating a Scoping Plan (as described below). California announced in July 2018 that the state emitted 427 MMTCO₂e in 2016 and achieved AB 32 goals (CARB 2018).

SB 32 was signed into law on September 8, 2016. SB 32 states that "In adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions authorized by this division, the state [air resources] board shall ensure that statewide GHG emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030."

Assembly Bill 1279: The California Climate Crisis

AB 1279 was signed into law in 2022 and establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045, and maintain net negative GHG emissions thereafter. AB 1279 would also ensure that by 2045 the statewide anthropogenic GHG emissions are reduced by at least 85 percent below 1990 levels. The bill requires CARB to ensure that an updated Scoping Plan identifies and recommends measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable carbon dioxide removal and carbon capture, utilization, and storage technologies to complement AB 1279's emissions reduction requirements.



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2022 Climate Change Scoping Plan

The 2022 Scoping Plan was approved in December 2022 and assesses progress toward achieving the SB 32 2030 target and laying out a path to achieve carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the state's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities (CARB 2022).

Cap-and-Trade Program

CARB administers the state's cap-and-trade program, which covers GHG sources that emit more than 25,000 metric tons of carbon dioxide equivalent per year (MTCO₂e/year), such as refineries, power plants, and industrial facilities. This market-based approach to reducing GHG emissions provides economic incentives for achieving GHG emission reductions.

Senate Bill 375: The Sustainable Communities and Climate Protection Act of 2008

SB 375 was signed into law on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits more than 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

CARB has prepared a Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets in 2018 which set updated GHG reduction targets for metropolitan planning organizations for 2020 and 2035. Pursuant to SB 375, the SCAG reduction targets for per capita vehicular emissions were 8 percent by 2020 and are 13 to 19 percent by 2035 (CARB 2024a).

Assembly Bill 1493: Pavley Regulations and Fuel Efficiency Standards

AB 1493, enacted on July 22, 2002, required CARB to develop and adopt regulations and fuel efficiency standards that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by USEPA's denial of an implementation waiver. USEPA subsequently granted the requested waiver in 2009, which was upheld by the by the U.S. District Court for the District of Columbia in 2011.

The standards were phased in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards resulted in an approximately 22 percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards resulted in about a 30 percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation, rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for



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engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

The second phase of the implementation for AB 1493 was incorporated into Amendments to the Low-Emission Vehicle Program, referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Cars program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation would reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The rules would reduce pollutants from gasoline and diesel-powered cars and would deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles, and hydrogen fuel cell cars. The regulations would also provide adequate fueling infrastructure for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

Senate Bill 1368: Emission Performance Standards

Enacted in 2006, SB 1368 directs the CPUC to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than five years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant.

Because of the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the law effectively prevents California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the state. The CPUC adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, of 1,100 pounds of CO₂ per megawatt-hour.

Senate Bill 1078: Renewable Electricity Standards

SB 1078 (September 12, 2002) required California to generate 20 percent of its electricity from renewable energy by 2017. SB 107 changed the due date to 2010 instead of 2017. On November 17, 2008, the governor signed Executive Order (EO) S-14-08, which established the Renewable Portfolio Standard (RPS) target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. EO S-21-09 directed CARB to adopt a regulation by July 31, 2010, requiring the state's load serving entities to meet a 33 percent renewable energy target by 2020. CARB approved the Renewable Electricity Standard on September 23, 2010, by Resolution 10-23. In 2011, the state legislature adopted this higher standard in SB X1-2. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas.

Senate Bill 350: Clean Energy and Pollution Reduction Act of 2015

SB 350 (October 7, 2015) reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the RPS, higher energy efficiency



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requirements for buildings, initial strategies toward a regional electricity grid, and improved infrastructure for electric vehicle charging stations.

Senate Bill 100: California Renewables Portfolio Standard Program

SB 100 (September 10, 2018) revised the RPS goals to achieve the 50 percent renewable resources target by December 31, 2026, and to achieve a 60 percent target by December 31, 2030. The bill requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024; 52 percent by December 31, 2027; and 60 percent by December 31, 2030. The bill also establishes a state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Under the bill, the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order S-01-07: Low Carbon Fuel Standard

EO S-01-07 was signed on January 18, 2007. The EO mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the EO established a Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, CARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in an implementation plan for the State Alternative Fuels Plan adopted by California Energy Commission on December 24, 2007, and was submitted to CARB for consideration as an "early action" item under AB 32. CARB adopted the LCFS on April 23, 2009.

The LCFS was subject to legal challenge in 2011. Ultimately, CARB was required to bring a new LCFS regulation for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS and new provisions designed to foster investments in the production of the low-carbon fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The Office of Administrative Law approved the regulation on November 16, 2015. The regulation was last amended in 2019, and approved on May 27, 2020 and became effective on July 1, 2020. The 2019 amendments provide clarification related to the Clean Fuel Reward program costs, credit transactions, fuels transactions and compliance reporting. Additional amendments have been proposed and are going to approval hearings in March 2024 (CARB 2024b).

Executive Order S-13-08: Climate Adaptation Strategy

EO S-13-08, which was signed by Governor Schwarzenegger in November 2008, states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in this EO,



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the 2009 California Climate Adaptation Strategy was adopted, which is the "... first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Executive Order B-48-18: Zero-Emission Vehicles

In January 2018, Governor Brown signed EO B-48-18 requiring all state entities to work with the private sector to have at least 5 million zero emission vehicles (ZEVs) on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 electric vehicle charging stations by 2025. It specifies that 10,000 of the electric vehicle charging stations should be direct current fast chargers. This order also requires all state entities to continue to partner with local and regional governments to streamline the installation of ZEV infrastructure. The Governor's Office of Business and Economic Development is required to publish a Plug-in Charging Station Design Guidebook and update the 2015 Hydrogen Station Permitting Guidebook to aid in these efforts. All state entities are required to participate in updating the 2016 Zero-Emissions Vehicle Action Plan to help expand private investment in ZEV infrastructure with a focus on serving low-income and disadvantaged communities. Additionally, all state entities are to support and recommend policies and actions to expand ZEV infrastructure at residential land uses, through the LCFS Program and recommend how to ensure affordability and accessibility for all drivers.

Executive Order N-79-20

In September 2020, Governor Newsom signed EO N-79-20, which sets the following goals for the state: 100 percent of in-state sales of new passenger cars and trucks shall be zero-emission by 2035; 100 percent of medium- and heavy-duty vehicles in the state shall be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks; and 100 percent of off-road vehicles and equipment in the state shall be zero-emission by 2035, where feasible.

Regional

SCAG Regional Transportation Plan/Sustainable Communities Strategy

The SCAG is the designated Metropolitan Planning Organization for the following six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. The SCAG develops long-range regional transportation plans, including sustainable communities strategies pursuant to SB 375, growth forecast components, regional transportation improvement programs, regional housing needs allocations, and a portion of the SCAQMD air quality plans (SCAG 2023).

In April 2024, the SCAG Regional Council approved the 2024-2050 RTP/SCS, which is entitled Connect SoCal 2024. Connect SoCal 2024 is a long-range visioning plan that builds upon and expands land use and transportation strategies to increase mobility options and achieve a more sustainable growth pattern (SCAG 2024). The 2024 RTP/SCS supersedes the previous RTP/SCS that was adopted in 2020.



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Local

City of Seal Beach General Plan

The City's General Plan is a comprehensive long-range general plan for the physical development of the City of Seal Beach (City of Seal Beach 2003). The General Plan contains the current Housing Element Update, which was adopted in 2022 and revised in 2024. The City's Housing Element Update includes the following goal and policies to promote energy efficiency which would in turn reduce GHG emissions:

Housing Element Update

Goal 6: Encourage more efficient energy use in residential developments.

- **Policy 6a:** Promote energy conservation through “green building” techniques that reduce water consumption, improve energy efficiency and lessen a building’s overall environmental impact.
- **Policy 6b:** Promote “smart growth” principles by encouraging compact development in locations that provide opportunities for reduced vehicle trips.

3.7.3 Environmental Impacts

This section discusses how GHG thresholds were determined and the thresholds of significance that were used for this analysis. Additionally, this section analyzes the Project's potential to result in significant GHG impacts. When an impact is determined to be significant, mitigation measures are identified that would reduce or avoid impacts.

Methodology for Analysis

The CalEEMod Version 2022.1.1.28 was used to estimate construction and operational GHG emissions from the Project. Construction emissions were estimated for the most emissions-intensive future development project under the Project, which is expected to be buildout of Housing Opportunity Site 4 as this site could accommodate the most dwelling units. Operational modeling assumed full Project buildout. Detailed model assumptions and inputs for all emissions calculations can be found in Appendix B.

Thresholds of Significance

After the adoption of AB 32, the SCAQMD established a GHG working group to develop thresholds of significance for the analysis of GHG emissions. In December 2008, the SCAQMD Board adopted the Interim CEQA Greenhouse Gas Significance Threshold, which established a screening threshold of 10,000 MTCO_{2e}/year for industrial projects and 3,000 MTCO_{2e}/year for residential and commercial projects (SCAQMD 2008). Additionally, the SCAQMD working group recommended that instead of an individual construction GHG threshold, construction emissions should be amortized over the life of the project (30 years) and evaluated with a project's annual, operational GHG emissions.



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CEQA Guidelines

In accordance with the CEQA Guidelines' Appendix G Environmental Checklist, the following questions were analyzed and evaluated to determine whether GHG emission impacts are significant.

Would the Project:

- a) *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*
- b) *Conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing the emission of greenhouse gases?*

Impact Analysis and Mitigation Measures

Generation of Greenhouse Gases

Impact GHG-1	The Project would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
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Impact Analysis

The Project does not propose any individual development projects at this time but, rather, would facilitate future developments in the City. For the purposes of the analysis contained in this Draft EIR, implementation of the Project would result in future development of up to 1,733 new dwelling units as outlined in Section 2.0, Project Description, of this Draft EIR. Buildout of the future developments facilitated by the Project would generate GHG emissions during construction and operations, as discussed in further detail below.

Construction Emission Inventory

GHG emissions would be generated during construction from off-road equipment and on-road vehicle exhaust from worker vehicle trips and hauling truck trips. Table 3.7-1, below, presents a summary of the estimated GHG emissions that would result from construction of Housing Opportunity Site 4, which is expected to be the most emissions-intensive future development project under the Project. The table also includes an estimate of the total GHG emissions associated with cumulative buildout of the entire Project, assuming that construction of every Project unit released the same volume of GHG. To be consistent with SCAQMD's GHG emissions policy, the table also presents construction emissions amortized over a 30-year Project lifetime.



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Table 3.7-1: Estimated Annual Construction GHG Emissions

Construction Year	Emissions (MTCO _{2e} per year)
2025	863.92
2026	405.74
<i>Total for Housing Opportunity Site 4</i>	<i>1,269.70</i>
Total for Full Project Buildout ¹	4,078
Amortized Construction Emissions from Full Project Buildout	135.94

¹ To estimate GHG emissions from Full Project Buildout, the emissions from construction of 552 units at Housing Opportunity Site 4 were scaled up on a unit-wise basis to 1,773 units for the purposes of the analysis contained in this Draft EIR.

Source: Appendix A.

The amortized construction emissions are added to the annual operational emissions and compared to the SCAQMD threshold of significance below.

Operational Emission Inventory

Operational, or long-term, emissions occur over the life of the Project. Operational activities of the future developments facilitated by the Project would generate GHG emissions primarily from mobile sources. Operational GHG emissions from cumulative Project buildout, as well as amortized construction emissions, are shown in Table 3.7-2.

Table 3.7-2: Project Operations – Greenhouse Gas Emissions (Unmitigated)

Source	Emissions (MTCO _{2e} per year)
Mobile	11,722
Area	30.6
Energy	2,890
Water	583
Waste	309
Refrigerants	2.12
<i>Operation Subtotal</i>	<i>15,637</i>
Amortized Construction Emissions from Full Project Buildout	136
Project Total	15,773
SCAQMD Thresholds of Significance	3,000
Exceeds Threshold?	Yes

Source: Appendix A.



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As shown in the table, full buildout of the dwelling units facilitated by the Project would result in GHG emissions that exceed the SCAQMD threshold of significance. Therefore, Mitigation Measure GHG-1, which provides a menu of GHG reduction measures, is required. Table 3.7-3 presents the Project's GHG emissions with application of the following GHG reduction measures:

- Provide electric vehicle charging infrastructure;
- Provide bicycle parking;
- Provide traffic-calming measures;
- Exceed Title 24 Building Energy Efficiency Standards by 10 percent;
- Require energy efficient appliances;
- Establish onsite solar energy systems sufficient to meet 50 percent of each structure's electricity demand;
- Install alternative water heater in place of gas storage tank water heater;
- Install electric space heater in place of natural gas heaters;
- Install electric ranges in place of gas ranges
- Require low-flow water fixtures;
- Replace gas-powered landscape equipment with zero-emission landscape equipment; and
- Prohibit the installation of fireplaces.

Table 3.7-3: Project Operations – Greenhouse Gas Emissions (Mitigated)

Source	Emissions (MTCO ₂ e per year)
Mobile	11,722
Area	-
Energy	1,922
Water	554
Waste	409
Refrigerants	2.12
<i>Operation Subtotal</i>	<i>14,609</i>
Amortized Construction Emissions from Full Project Buildout	136



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Source	Emissions (MTCO ₂ e per year)
Project Total	14,745
SCAQMD Thresholds of Significance	3,000
Exceeds Threshold?	Yes

Source: Appendix A.

As presented above, while implementation of Mitigation Measure GHG-1 would reduce GHG emissions, the level of emissions would not be reduced to below the 3,000 MTCO₂e per year threshold.

This EIR includes a discussion of the residential component of the ORCC Specific Plan Project based on the site location and proposed buildout of the 167 dwelling units that are included within the City's site inventory to meet its RHNA requirements. The impacts from construction of a larger residential development were evaluated within Table 3.7-1. Additionally, operational impacts from the total 1,773 units were evaluated within Tables 3.7-2 and 3.7-3. Emissions were found to exceed GHG draft interim thresholds and therefore, the 167 dwelling units proposed under the ORCC Specific Plan Project were considered within the analysis of this Project. Specific impact findings associated with the development of the ORCC Specific Plan Project are being evaluated in a standalone EIR.

Conclusion

As demonstrated above, the Project could generate GHG emissions that may have a significant impact on the environment. While implementation of Mitigation Measure GHG-1 would reduce GHG impacts, the Project would still result in emissions that exceed the applicable threshold of significance. Future developments evaluated as part of the Project may be subject to discretionary permits and future CEQA review on a project-by-project basis. Regardless, the impact would be significant and unavoidable.

Level of Significance Before Mitigation

Potentially Significant Impact.

Mitigation Measures

MM GHG-1: Implement GHG Reduction Measures. In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the California Environmental Quality Act (CEQA) Guidelines, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to greenhouse gas (GHG) emissions. Such measures may include the following or other comparable measures identified by the City:

- a) Integrate green building measures consistent with CALGreen (California Building Code Title 24), local building codes and other applicable laws, into project design including:
 - o Use energy efficient materials in building design, construction, rehabilitation, and retrofit.



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- Install energy-efficient lighting, heating, and cooling systems (cogeneration); water heaters; appliances; equipment; and control systems.
- Reduce lighting, heating, and cooling needs by taking advantage of light-colored roofs, trees for shade, and sunlight.
- Incorporate passive environmental control systems that account for the characteristics of the natural environment.
- Use high-efficiency lighting and cooking devices.
- Incorporate passive solar design.
- Use high-reflectivity building materials and multiple glazing.
- Prohibit gas-powered landscape maintenance equipment.
- Install electric vehicle charging stations.
- Reduce wood burning stoves or fireplaces.
- Provide bike lanes accessibility and parking at residential developments.
- b) Include offsite measures to mitigate a project's emissions.
- c) Measures that consider incorporation of Best Available Control Technology (BACT) during design, construction, and operation of projects to minimize GHG emissions, including but not limited to:
 - Use energy and fuel-efficient vehicles and equipment;
 - Deployment of zero- and/or near zero emission technologies;
 - Use lighting systems that are energy efficient, such as LED technology;
 - Use the minimum feasible amount of GHG-emitting construction materials;
 - Use cement blended with the maximum feasible amount of flash or other materials that reduce GHG emissions from cement production;
 - Incorporate design measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse;
 - Incorporate design measures to reduce energy consumption and increase use of renewable energy;
 - Incorporate design measures to reduce water consumption;
 - Use lighter-colored pavement where feasible;
 - Recycle construction debris to maximum extent feasible;
 - Plant shade trees in or near construction projects where feasible; and
 - Solicit bids that include concepts listed above.
- d) Measures that encourage transit use, carpooling, bike-share and car-share programs, active transportation, and parking strategies, including, but not limited to the following:
 - Promote transit-active transportation coordinated strategies;
 - Increase bicycle carrying capacity on transit and rail vehicles;
 - Improve or increase access to transit;
 - Increase access to common goods and services, such as groceries, schools, and day care;
 - Incorporate the neighborhood electric vehicle network;
 - Orient the project toward transit, bicycle and pedestrian facilities;
 - Improve pedestrian or bicycle networks, or transit service;



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- Provide traffic calming measures;
- Provide bicycle parking;
- Limit or eliminate park supply;
- Unbundle parking costs;
- Provide parking cash-out programs;
- Implement or provide access to commute reduction program;
- d) Incorporate bicycle and pedestrian facilities into project designs, maintaining these facilities, and providing amenities incentivizing their use; and planning for and building local bicycle projects that connect with the regional network;
- e) Improving transit access to rail and bus routes by incentives for construction of transit facilities within developments, and/or providing dedicated shuttle service to transit stations; and
- f) Designate a percentage of parking spaces for ride-sharing vehicles or high occupancy vehicles, and provide adequate passenger loading and unloading for those vehicles;
- g) Land use siting and design measures that reduce GHG emissions, including:
 - Retaining onsite mature trees and vegetation, and planting new canopy trees;
 - Measures that increase vehicle efficiency, encourage use of zero and low emissions vehicles, or reduce the carbon content of fuels, including constructing or encouraging construction of electric vehicle charging stations or neighborhood electric vehicle networks, or charging for electric bicycles; and
 - Measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse.

Level of Significance After Mitigation

Significant and Unavoidable Impact.

Conflict with an Applicable Plan, Policy, or Regulation

Impact GHG-2	The Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.
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Impact Analysis

A project would have a significant impact with respect to GHG emissions and global climate change if it would substantially conflict with the provisions of Section 15064.4(b) of the CEQA Guidelines. Pursuant to Appendix G of the CEQA Guidelines, a significant GHG impact is identified if the project could conflict with applicable GHG reduction plans, policies, or regulations. The Project would be subject to complying with SB 32 and AB 1279. For this analysis, the applicable plans adopted for the purpose of reducing GHG emissions are the CARB's 2022 Scoping Plan and the SCAG RTP/SCS. Project consistency with the foregoing plans is evaluated below.

Consistency with the CARB's 2022 Scoping Plan

The 2022 Scoping Plan, approved in December 2022, builds upon previous iterations of state scoping plans to achieve carbon neutrality and reduce anthropogenic GHG emissions below 85 percent below



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1990 no later than 2045, as directed by AB 1279 (CARB 2022). Table 3.7-4 identifies the Scoping Plan policies that may be applicable to the developments facilitated by the Project.

Table 3.7-4: Project Consistency with 2022 Scoping Plan Greenhouse Gas Reduction Strategies

Measure	Consistency Determination
Deploy ZEVs and reduce driving demand	Consistent. While the Project would not deploy ZEVs, consistent with the 2022 California Building Standards Code, or applicable code at the time of construction, all residential buildings facilitated by the Project would include EV-capable infrastructure to accommodate future installation of a Level 2 EV charger.
Coordinate supply of liquid fossil fuels with declining CA fuel demand	Not Applicable. This measure is aimed at petroleum refineries and fossil fuel extraction operations. The Project would not interfere with this goal.
Generate clean electricity	Consistent. Development facilitated by the Project would comply with all relevant provisions included in the California Building Standards Code applicable at the time of construction. Pursuant to the 2022 California Building Standards Code, new residential structures shall include rooftop solar panels to generate clean electricity.
Decarbonize Buildings	Consistent. Development facilitated by the Project would comply with all applicable provisions included in the California Building Standards Code applicable at the time of construction, which would help reduce GHG emissions associated with building operations. Further, implementation of Mitigation Measure GHG-1 would ensure that each future development facilitated by the Project would reduce GHG emissions.
Decarbonize Industrial Energy Supply	Not Applicable. The Project would facilitate development of residential land uses and would not affect the industrial sector.
Reduce non-combustion emissions (Methane)	Consistent. The Project would facilitate development of residential land uses and would not include any land uses that generate significant levels of methane, such as landfills or dairy farms.
Reduce non-combustion emissions (Hydrofluorocarbons [HFCs])	Consistent. Development facilitated under the Project would comply with all state regulations governing SLCPs, including HFCs.
Compensate for remaining emissions	Not Applicable. This measure is aimed at the state government to reduce statewide emissions to meet AB 1279 goals.

Source: CARB 2022.

This analysis finds that, with implementation of Mitigation Measure GHG-1, the Project would be consistent with the applicable strategies recommended in the 2022 Scoping Plan.

Consistency with the SCAG's Connect SoCal 2024

In April 2024, the SCAG Regional Council approved the 2024-2050 Connect SoCal RTP/SCS. The primary goal of Connect SoCal 2024 is to achieve sustainable regional growth while reducing GHG emissions through transportation and land use planning. Project consistency with the specific goals of Connect SoCal 2024 which are applicable to the Project are evaluated in Table 3.7-5.



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Table 3.7-5: Project Consistency with Connect SoCal 2024 Greenhouse Gas Reduction Strategies

Goal	Consistency Determination
Goal 36: Encourage housing development in transit-supportive and walkable areas to create more interconnected and resilient communities	Consistent. Implementation of the Project would inherently support this goal. For the purposes of the analysis contained in this Draft EIR, the Project would facilitate the development of up to 1,773 dwelling units throughout the City. The housing types consist of multi-family residences designated for varying income levels, including low-income and moderate-income units. Additionally, Orange County Transportation Authority and Long Beach Transit both provide public transit services throughout the City. Thus, future residents of future developments facilitated by the Project would have access to public transportation options.
Goal 37: Support local, regional, state and federal efforts to produce and preserve affordable housing while meeting additional housing needs across the region.	Consistent. See discussion above. Additionally, by implementing the Housing Element Update and demonstrating the City's ability to achieve provide housing at varying income levels, the Project would help encourage a diverse housing stock and contribute to more equitable communities.
Goal 51: Reduce hazardous air pollutants and greenhouse gas emissions and improve air quality throughout the region through planning and implementation efforts.	Consistent. Implementation of Mitigation Measures AQ-1, AQ-2, AQ-3, and GHG-1 would ensure that the Project reduces air and GHG emissions.

Source: SCAG 2024a.

The RTP/SCS generally encourages residential growth within identified priority growth areas, transit priority areas, and high-quality transit areas in order to facilitate the use of public transit and reduce per capita VMT. The City of Seal Beach does not include any priority growth areas, transit priority areas, and high-quality transit areas. However, multi-family housing is known to have a lower trip generation rate as compared to single-family residential units (Institute of Transportation Engineers 2021). Furthermore, infill development and densification also support a reduced rate of single-passenger vehicle trips (Governor's Office of Land Use and Climate Innovation 2024).

Based on the above, with implementation of Mitigation Measures AQ-1, AQ-2, AQ-3, and GHG-1, the Project is considered consistent with the overarching goals of Connect SoCal 2024.

This EIR includes a discussion of the residential component of the ORCC Specific Plan Project based on the site location and proposed buildout of the 167 dwelling units that are included within the City's site inventory to meet its RHNA requirements. Consistency with CARB's 2022 Scoping Plan and SCAQG's Connect SoCal 2024 were evaluated for the buildout of 1,773 dwelling units and therefore, the 167 dwelling units proposed under the ORCC Specific Plan Project were considered within the analysis of this Project. Specific impact findings associated with the development of the ORCC Specific Plan Project are being evaluated in a standalone project-specific EIR.

Conclusion

The Project could conflict with an applicable plan adopted for the purpose of reducing GHG emissions; therefore, impacts could be considered significant. However, with the implementation of mitigation, the



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Project would comply with all applicable measures in the 2022 Scoping Plan and the RTP/SCS, and the impact would be reduced to a less-than-significant level.

Level of Significance Before Mitigation

Potentially Significant Impact.

Mitigation Measures

Mitigation Measures AQ-1, AQ-2, AQ-3, and GHG-1 are required.

Level of Significance After Mitigation

Less Than Significant Impact with Mitigation.

3.7.4 Cumulative Impacts

CEQA requires that EIRs evaluate the potential cumulative impacts of a project. A project's environmental impacts are "cumulatively considerable" if the "incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (CEQA Guidelines Section 15065(a)(3)). The geographic scope for cumulative GHG impacts is the state as California has GHG reduction rules that all projects and jurisdictions within the state would be subject to.

As discussed in Section 3.0, Environmental Analysis, CEQA Guidelines Section 15130 requires cumulative impact analysis in EIRs to consider a list of planned and pending projects that may contribute to the cumulative impacts of a project. Section 3.0, Table 3.0-3 identifies all past, present, and probable future residential projects in the City and surrounding areas that may impact the Project. Table 3.7-6 identifies the cumulative past, present, and probable future projects from Table 3.0-3 that may drive a potential cumulative impact related to GHG emissions and therefore were analyzed in this cumulative discussion.

Table 3.7-6: Cumulative Projects Related to Greenhouse Gas Emissions

#	Project Name	Location	Project Characteristics	Status	Total Dwelling Units
1	Old Ranch Country Club Project	Old Ranch Country Club, City of Seal Beach	Construction of a 116-unit, 4-level (188,500 square feet) multi-family housing development; a 51-unit, 3-level senior housing complex; medical office facility; overnight accommodation, including a bar and lounge and	Preparation of EIR	167



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#	Project Name	Location	Project Characteristics	Status	Total Dwelling Units
			specialty restaurant		
2	Naval Weapons Station	Pacific Coast Hwy & Seal Beach Boulevard	Potential future housing developments proposed within the Naval Weapons Station	Anticipated	150
3	Water Storage Site	Within the Naval Weapons Station, approximately 1,000 feet east of Seal Beach Boulevard, near the housing community off Anchor Way	Potential future housing developments proposed within the Naval Weapons Station	Anticipated	65
4	Lampson Project	4665 Lampson Avenue, City of Los Alamitos	Redevelopment of existing office building with a residential development consisting of cluster homes, townhomes, and apartments totaling 246 units	Approved (By City of Los Alamitos)	246
5	Onni Marina Shores	6500-6670 E. Pacific Coast Hwy, City of Long Beach (7242011013)	Two, 5-story buildings with a total of 563,529 square feet containing 600 residential units and 4,000 square-feet of ground-level restaurant space	Approved (By City of Long Beach)	600
6	Carmel Partners	6615 E. Pacific Coast Hwy, City of Long Beach (7237020050)	Construction of a six-story mixed-use project consisting of 390 residential dwelling units and 5,351 square feet of commercial/retail space	Approved (By City of Long Beach)	380



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#	Project Name	Location	Project Characteristics	Status	Total Dwelling Units
7	Holland Partners	6700 E. Pacific Coast Hwy, City of Long Beach (7242012006)	Construction of a new mixed-use project consisting of 281 residential dwelling units, 3,100 square feet of commercial/retail space in a building with 592,100 square feet of area	Approved (By City of Long Beach)	281
8	Long Beach Housing Element Site	6695 E. Pacific Coast Hwy (7237020040); 6411 E. Pacific Coast Hwy (7237020051); No address (7237020904)	Candidate site identified in the City of Long Beach's Housing Element as a site for potential future residential development	Proposed in Housing Element Update (By City of Long Beach)	940
9	Long Beach Housing Element Site	1000 N Studebaker Rd (7238015021)	Candidate site identified in the City of Long Beach's Housing Element as a site for potential future residential development	Proposed in Housing Element Update (By City of Long Beach)	115
10	Orange County Housing Element Sites	11061 Los Alamitos Blvd (086-521-47); 11031 Los Alamitos Blvd (086-521-46); 3352 Katella Ave (086-521-19); 11131 Los Alamitos Blvd (086-521-23); 11088 Wallingsford Rd (086-521-11); 11171 Los Alamitos Blvd (086-521-24)	Candidate site identified in the County of Orange's Housing Element as a site for potential future residential development	Proposed in Housing Element Update (By Orange County)	619
11	Westminster Housing Element Sites	13251 Springdale	Candidate site identified in the City of	Proposed in Housing Element Update	122



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#	Project Name	Location	Project Characteristics	Status	Total Dwelling Units
		Street (203-073-04); Dorothy Lane /Melanie Lane (203-073-05); Dorothy Lane/Lee Drive (203-073-01 and 203-073-03)	Westminster's Housing Element as a site for potential future residential development	(By City of Westminster)	

Development under the Project in combination with cumulative development identified in Table 3.7-6 could increase GHG emissions.

Global GHG emissions are inherently a cumulative issue that is understood for CEQA purposes to be an existing significant and adverse condition. GHG emissions from one project cannot, on their own, result in changes in climatic conditions; therefore, the emissions from any project must be considered in the context of their contribution to cumulative global emissions, which is the basis for determining a significant cumulative impact. This is determined through the project's consistency with applicable GHG emission thresholds and applicable plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs. Although the geographic scope of cumulative impacts related to GHG emissions is global, this analysis focuses on the Project's direct and/or indirect generation of GHG emissions on the region and the state. As discussed in this analysis, implementation of the Project, would result in a significant impact related to GHG emissions. Therefore, the Project's incremental contribution to the existing significant impact is cumulatively considerable.

3.7.5 References

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