

2.4 Greenhouse Gas Emissions and Energy

This section of the SEIR summarizes information from the *Greenhouse Gas Evaluation* prepared by Scientific Resources Associated (February 3, 2017) for the proposed Project, included as Appendix E of this SEIR. By nature, greenhouse gas and global climate change evaluations are a cumulative study, which takes into account the entirety of the immediately surrounding area.

2.4.1 Existing Conditions

2.4.1.1 *Environmental Setting*

Background

Global climate change (GCC) refers to changes in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a greenhouse. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Without these natural GHGs, the Earth's temperature would be about 61 degrees Fahrenheit cooler. Emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere.

GCC may result from natural factors, natural processes, and/or human activities that change the composition of the atmosphere and alter the surface and features of land. Although the conceptual existence of GCC is generally accepted, the extent to which global climate change attributable to anthropogenic (human) emissions of GHGs (mainly CO₂, CH₄, and N₂O) is currently one of the most important and widely debated scientific, economic and political issues in the United States. There is consensus among scientific experts that GCC is attributable to human impacts on the earth's environment. Historical records indicate that global climate changes have occurred in the past due to natural phenomena (such as during previous ice ages). Some data indicate that the current global conditions differ from past climate changes in rate and magnitude. The State of California has been at the forefront of developing solutions to address potential anthropogenic impacts to GCC.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. When accounting for GHGs, all types of GHG emissions are expressed in terms of CO₂ equivalents (CO₂e) and are typically quantified in metric tons (MT) or millions of metric tons (MMT). The IPCC concluded that a stabilization of GHGs

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at 400 to 450 ppm CO₂e concentration is required to keep global mean warming below 3.6 degrees Fahrenheit (°F) (2° Celsius), which is assumed to be necessary to avoid dangerous climate change (Association of Environmental Professionals 2007).

State law defines greenhouse gases as any of the following compounds: CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) [California Health and Safety Code Section 38505(g)]. CO₂, followed by CH₄ and N₂O, are the most common GHGs that result from human activity.

Sources and Global Warming Potentials of GHG

As discussed further below, the sources of GHG emissions, global warming potential (GWP), and atmospheric lifetime of GHGs are all important variables to be considered in the process of calculating CO₂e for discretionary land use projects that require a climate change analysis.

The California ARB compiled a statewide inventory of anthropogenic GHG emissions and sinks that includes estimates for CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs (ARB 2015). The current inventory covers the years 1990 to 2013, and is summarized in Table 2.4-1, *State of California GHG Emissions by Sector*. Data sources used to calculate this GHG inventory include California and federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the IPCC. The 1990 emissions level is the sum total of sources and sinks from all sectors and categories in the inventory. The inventory is divided into seven broad sectors and categories in the inventory. These sectors include: Agriculture, Commercial, Electricity Generation, Forestry, Industrial, Residential, and Transportation.

GHGs have varying GWP. The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the “cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas” (USEPA 2006). The reference gas for GWP is CO₂; therefore, CO₂ has a GWP of one. The other main greenhouse gases that have been attributed to human activity include CH₄, which has a GWP of 28, and N₂O, which has a GWP of 265 (ARB 2014). The California Emissions Estimator (CalEEMod) Model calculates CO₂e emissions based on previous values for GWPs. This analysis uses the updated ARB GWP values shown above; therefore, CalEEMod Model emission estimates were adjusted based on these GWPs. Table 2.4-2, *Global Warming Potentials and Atmospheric Lifetimes of GHGs*, presents the GWP and atmospheric lifetimes of the GHGs that are regulated by the state of California.

Human-caused sources of CO₂ include combustion of fossil fuels (coal, oil, natural gas, gasoline, and wood). Data from ice cores indicate that CO₂ concentrations remained steady prior to the current period for approximately 10,000 years. Concentrations of CO₂ have increased in the atmosphere since the industrial revolution.

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CH₄ is the main component of natural gas and also arises naturally from anaerobic decay of organic matter. Human-caused sources of natural gas include landfills, fermentation of manure and cattle farming. Human-caused sources of N₂O include combustion of fossil fuels and industrial processes such as nylon production and production of nitric acid.

Other GHGs are present in trace amounts in the atmosphere and are generated from various industrial or other uses.

In addition to the State of California GHG Inventory, a more specific regional GHG inventory was prepared by the University of San Diego School of Law Energy Policy Initiative Center, a non-regulatory, academic and research center (University of San Diego 2008). This San Diego County Greenhouse Gas Inventory (SDCGHGI) is a detailed inventory that takes into account the unique characteristics of the region in calculating emissions. The SDCGHGI calculated GHG emissions for 1990, 2006, and projected 2020 emissions.

Areas where feasible reductions can occur and the strategies for achieving those reductions are outlined in the SDCGHGI. A summary of the various sectors that contribute GHG emissions in San Diego County for the year 2006 is provided in Table 2.4-3, *San Diego County 2006 GHG Emissions by Category*. Total GHGs in San Diego County are estimated at 34 MMTCO_{2e}.

According to the SDCGHGI, a majority of the region's emissions are attributable to on-road transportation, with the next largest source of GHG emissions attributable to electricity generation. Similarly, a majority of the emissions resulting from land development projects will be attributable to on-road transportation emissions. According to the SDCGHGI study, the emission reductions for on-road transportation will be achieved in a variety of ways, including through regulations aimed at increasing fuel efficiency standards and decreasing vehicle emissions. These regulations are outside the control of project applicants.

Similar to on-road emissions, the SDCGHGI indicated that the necessary emission reductions for electricity generation will be achieved in a variety of ways, including through implementation of the renewable portfolio standard (RPS), cleaner electricity purchases by San Diego Gas & Electric, replacement of the Boardman Contract (which allows the purchase of electricity from coal-fired power plants), and implementation of 400 MW of photovoltaics. These measures are also outside the control of project applicants. The SDCGHGI indicates that reduction in electricity consumption of 10 percent would contribute to the required reduction in GHG emissions required to reduce emissions to 1990 levels by 2020.

Typical Adverse Effects

The Climate Scenarios Report (CCCC 2006), uses a range of emissions scenarios developed by the IPCC to project a series of potential warming ranges (i.e., temperature

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increases) that may occur in California during the 21st century. Three warming ranges were identified: Lower warming range (3.0 to 5.5 °F); medium warming range (5.5 to 8.0 °F); and higher warming range (8.0 to 10.5°F). The Climate Scenarios Report then presents an analysis of the future projected climate changes in California under each warming range scenario.

According to the Climate Scenarios Report, substantial temperature increases would result in a variety of impacts to the people, economy, and environment of California. These impacts would result from a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. These impacts are described below.

Public Health. Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to O₃ formation are projected to increase by 25 to 35 percent under the lower warming range and 75 to 85 percent under the medium warming range. In addition, if global background O₃ levels increase as is predicted in some scenarios, it may become impossible to meet local air quality standards. An increase in wildfires could also occur, and the corresponding increase in the release of pollutants including PM_{2.5} could further compromise air quality. The Climate Scenarios Report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases (such as malaria, dengue fever, yellow fever, and encephalitis) may increase, such as those spread by mosquitoes and other disease-carrying insects.

Potential public health impacts from climate change would be global in nature rather than site-specific. That being said, because the Project site is not located in an area that is subject to climate sensitive diseases (such as the tropics), it is unlikely that risks associated with these diseases would increase substantially. It is too speculative to estimate the potential frequency of heat waves at the Project site that would be associated with global climate change.

Water Resources. A vast network of reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada mountain snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages. In addition, if temperatures continue to rise more precipitation would fall as rain instead of snow, further reducing the Sierra

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Nevada spring snowpack by as much as 70 to 90 percent. The State's water resources are also at risk from rising sea levels. An influx of seawater would degrade California's estuaries, wetlands, and groundwater aquifers.

Impacts to water resources could affect the Project site through decreased availability of water in southern California overall. Decreased availability could lead to higher prices and water rationing. However, due to the scientific and factual uncertainties regarding the effects of climate change at a regional level, it is too speculative to quantify the effect of this impact.

Agriculture. Increased GHG and associated increases in temperature are expected to cause widespread changes to the agricultural industry, reducing the quantity and quality of agricultural products statewide. Significant reductions in available water supply to support agriculture would also impact production. Crop growth and development will change as will the intensity and frequency of pests and diseases.

This potential effect of climate change would not impact the proposed Project because the Project does not involve agricultural uses.

Ecosystems/Habitats. Continued global warming will likely shift the ranges of existing invasive plants and weeds, thus alternating competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Continued global warming is also likely to increase the populations of and types of pests. Continued global warming would also affect natural ecosystems and biological habitats throughout the State.

Due to the scientific and factual uncertainties regarding the effects of climate change at a regional and site-specific level, particularly as to sensitive biological resources, it is too speculative to assess the effect of this impact on the Project site.

Wildland Fires. Global warming is expected to increase the risk of wildfire and alter the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the State.

The Project site generally has a low potential for fire risks due to the type of on-site vegetation.

Sea Level Rising and Coastal Flooding. Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the State's coastal regions. Under the high warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. A sea level risk of this magnitude would inundate coastal areas with

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salt water, accelerate coastal erosion, threaten levees and inland water systems, and disrupt wetlands and natural habitats.

Due to the Project's location 12 miles inland, there is no risk to the Project site due to sea level rise and coastal flooding.

California Climate Adaption Strategy. As part of its climate change planning process, the California Natural Resources Agency (CNRA) prepared its California Climate Adaptation Strategy (CNRA 2009) to summarize the best known science on climate change impacts in California, with the goal of assessing vulnerability to climate change impacts. According to the ARB, some of the potential California-specific impacts of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. To protect the State's public health and safety, resources, and economy, the California Natural Resources Agency—in coordination with other state agencies—has updated the 2009 California Climate Adaptation Strategy that is titled, *Safeguarding California: Reducing Climate Risk*. The final *Safeguarding California* plan is dated July 2014, and provides policy guidance for state decision makers relative to climate risks in nine sectors: agriculture; biodiversity and habitat; emergency management; energy; forestry; ocean and coastal ecosystems and resources; public health; transportation; and water. It also identifies policies for reducing GHG emissions and accelerating the transition to a clean-energy economy through reductions in emissions, readiness, and continued research (CNRA 2014). The California Climate Adaptation Strategy takes into account the long-term, complex, and uncertain nature of climate change and establishes a proactive foundation for an ongoing adaptation process.

Existing Site Conditions

The site is currently undeveloped and includes disturbed areas and native vegetation, consisting mainly of coastal sage scrub and grassland. Natural vegetation and soils temporarily store carbon as part of the terrestrial carbon cycle. Carbon is assimilated into plants and animals as they grow and then dispersed back into the environment when they die.

There are two existing sources of carbon storage at the Project site: natural vegetation and soils. It is difficult to assess net changes in carbon storage associated with the proposed Project, but carbon sequestration rates for native vegetation in the Otay Mesa region are relatively low in comparison to heavily vegetated areas such as forests. For example, according to the EPA (<http://www.epa.gov/sequestration/rates.html>), riparian areas are estimated to sequester from 0.1 to 0.3 metric tons of CO₂e per acre per year in comparison to forests, which are estimated to sequester 0.6 to 2.6 metric tons of CO₂e per acre per year. Native vegetation in the Otay Mesa region, which consists mainly of scrub, native- and non-native grassland, and disturbed areas, would be expected to provide a low level of carbon sequestration.

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The key issue is the balance between the loss of natural vegetation and future carbon storage associated with landscaping. The situation is further complicated by changes in fire regime. Carbon in natural vegetation is likely to be released into the atmosphere through wildfire every 20 to 150 years. Carbon in landscaped areas would be protected from wildfire. The balance between these factors influence the long-term carbon budget on the site. As discussed in Section 2.4.2.5, the impacts of carbon sequestration loss have been evaluated in the GHG inventory.

2.4.1.2 Methodology

The Project has been evaluated on the basis of an efficiency metric which assesses the annual GHG emissions per service population. Service population is defined as the residents plus full-time employees. The efficiency metric is derived based on the future statewide GHG emissions reductions goals divided by the statewide service population, derived as discussed below.

The efficiency metric assesses the GHG efficiency of a project on a “service population (SP)” basis (efficiency metric = project emissions divided by the sum of the number of jobs and the number of residents provided by a project). The metric represents the rate of emissions needed to achieve a fair share of the State’s emissions mandate embodied in AB 32. The use of “fair share” in this instance indicates the GHG efficiency level that, if applied statewide, would meet the AB 32 emissions target and support efforts to reduce emissions beyond 2020.

The efficiency metric is based on the AB 32 GHG reduction target and GHG emissions inventory prepared for ARB’s 2008 Scoping Plan. To develop the efficiency metric for 2020, land-use driven sectors in ARB’s 1990 GHG inventory were identified and separated to tailor the inventory to land use projects. This process removes emission sources not applicable to land use projects. The land- use driven sector inventory for 1990 was divided by the service population projections for California in 2020. The efficiency metric allows the threshold to be applied evenly to most project types (residential, commercial/retail and mixed use) and employs an emissions inventory comprised only of emission sources from land-use related sectors. The efficiency metric allows lead agencies to assess whether any given project or plan would accommodate population and employment growth in a way that is consistent with the emissions limit established under AB 32.

ARB has indicated that an average statewide GHG reduction of 5.2 percent per year between 2020 and 2050 is necessary to achieve the 2030 and 2050 emissions reduction goals of Executive Orders B-30-15 and S-3-05 (ARB 2015). Efficiency metrics can be derived for each year between 2020 and 2050 based on this identified reduction downward direction, or based on other sources if supported by substantial evidence.

Because the Project will be built out by 2028, the efficiency metric is derived for 2028. The derivation of the 2028 efficiency metric is shown in Table 2.4-4. *Derivation of Efficiency Metric, 2028 Buildout*, and has been used in this analysis to evaluate

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significance of impacts. Based on the projections of statewide emissions and population and employment projections, the 2028 efficiency metric is 3.0 metric tons of CO₂e per service population. This efficiency metric was used to evaluate the Project's impacts.

2.4.1.3 Regulatory Framework

All levels of government have some responsibility for the protection of air quality, and each level (Federal, State, and regional/local) has specific responsibilities relating to air quality regulation. GHG emissions and the regulation of GHGs is a relatively new component of this air quality regulatory framework.

National and International Efforts

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis for human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change. Under the Convention, governments agreed to gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of global climate change. The U.S. Supreme Court rules in *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007), that EPA has the ability to regulate GHG emissions. In addition to the national and international efforts described above, many local jurisdictions have adopted climate change policies and programs.

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

Endangerment Finding: EPA found that the current and projected concentrations of the six key well-mixed GHGs (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) in the atmosphere threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: EPA found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

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These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite to finalizing the USEPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by USEPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009 and adopted on April 1, 2010. As finalized in April 2010, the emissions standards rule for vehicles will improve average fuel economy standards to 35.5 miles per gallon by 2016. In addition, the rule will require model year 2016 vehicles to meet an estimated combined average emission level of 250 grams of carbon dioxide per mile.

Mandatory GHG Reporting Rule. On March 10, 2009, in response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), the USEPA proposed a rule that requires mandatory reporting of GHG emissions from large sources in the United States. On September 22, 2009, the Final Mandatory Reporting of Greenhouse Gases Rule was signed, and was published in the Federal Register on October 30, 2009. The rule became effective on December 29, 2009. The rule will collect accurate and comprehensive emissions data to inform future policy decisions.

The USEPA is requiring suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions to submit annual reports to USEPA. The gases covered by the proposed rule are CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, and other fluorinated gases, including nitrogen trifluoride (NF₃) and hydrofluorinated ethers (HFE).

State Regulations

The following subsections describe regulations and standards that have been adopted by the State of California to address GCC issues.

Senate Bill 97. Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs OPR to develop draft CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" by July 1, 2009, and directs the Resources Agency to certify and adopt the CEQA guidelines by January 1, 2010.

OPR published a technical advisory on CEQA and climate change on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR had asked the ARB to "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of greenhouse gas emissions throughout the state." The OPR technical advisory does recommend that CEQA analyses include the following components:

- Identification of greenhouse gas emissions;
- Determination of significance; and
- Mitigation of impacts, as needed and as feasible.

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On December 31, 2009, the CNRA adopted the proposed amendments to the State CEQA Guidelines. These amendments became effective on March 18, 2010.

Senate Bill 32. Senate Bill 32 was enacted by the California Legislature on September 8, 2016 to require the ARB to approve a statewide GHG emissions limit to reduce GHG emissions to 40 percent below 1990 levels by 2030. The bill codified the target identified in Executive Order B-30-15 and authorizes the ARB to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions and ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030.

Senate Bill 375. SB 375 finds that GHG from autos and light trucks can be substantially reduced by new vehicle technology, but even so “it will be necessary to achieve significant additional greenhouse gas reductions from changed land use patterns and improved transportation. Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32.” Therefore, SB 375 requires that regions with metropolitan planning organizations adopt sustainable communities strategies, as part of their regional transportation plans, which are designed to achieve certain goals for the reduction of GHG emissions from mobile sources.

SB 375 also includes CEQA streamlining provisions for "transit priority projects" that are consistent with an adopted sustainable communities strategy. As defined in SB 375, a "transit priority project" shall: (1) contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 and 50 percent nonresidential uses, a floor area ratio of not less than 0.75; (2) provide a maximum net density of at least 20 dwelling units per acre; and (3) be within 0.5 mile of a major transit stop or high quality transit corridor.

Assembly Bill 32, the California Global Warming Solutions Act of 2006. In September 2006, Governor Schwarzenegger signed California AB 32, the global warming bill, into law. AB 32 directs the ARB to do the following:

- Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit.
- Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020.
- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures.
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and non-

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monetary incentives that reduce GHG emissions from any sources or categories of sources that ARB finds necessary to achieve the statewide GHG emissions limit.

- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

AB 32 required that, by January 1, 2008, the ARB determine what the statewide GHG emissions level was in 1990, and approve a statewide GHG emissions limit that is equivalent to that level, to be achieved by 2020. The ARB adopted its Scoping Plan in December 2008, which provided estimates of the 1990 GHG emissions level and identified sectors for the reduction of GHG emissions. The ARB estimated that the 1990 GHG emissions level was 427 MMT net CO₂e, and the projection for “business as usual” emissions for 2020 was 596 MMT net CO₂e. The ARB therefore estimated that a reduction of 169 MMT net CO₂e emissions below “business as usual” levels would be required by 2020 to meet the 1990 level. This amounted to roughly a 28.35 percent reduction from projected business-as-usual levels in 2020. In 2011, the ARB developed a supplement to the AB 32 Scoping Plan. The Supplement updated the emissions inventory based on current projections for “business as usual” emissions for 2020 to 506.8 metric tons of CO₂e. The updated projection included adopted measures (Pavley 1 fuel efficiency standards, 20 percent Renewable Portfolio Standard requirement), and estimated that an additional 16 percent reduction below the estimated “business as usual” levels would be necessary to return to 1990 levels by 2020.

In 2014, the ARB published its First Update to the Climate Change Scoping Plan. The First Update indicates that the State is on target to meet the goal of reducing GHG emissions to 1990 level by 2020. The First Update tracks progress in achieving the goals of AB 32, and lays out a new set of actions that will move the State further along the path to achieving the 2050 goal of reducing emissions to 80 percent below 1990 levels. While the Update discusses setting a mid-term target, the plan does not yet set a quantifiable target toward meeting the 2050 goal. A second update was published in January of 2017. This update establishes a proposed framework of action for California to meet the most aggressive climate change target in North America: a 40 percent reduction in greenhouse gases by 2030 compared to 1990 levels. This goal builds on California’s success in establishing effective policies that are reducing emission of GHG while delivering substantial economic and environmental benefits.

Executive Order S-3-05. Executive Order S-3-05, signed by Governor Schwarzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the California EPA (CalEPA) to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, *Our Changing Climate: Assessing Risks to California*, and its supporting document *Scenarios of Climate Change in California: An Overview* were published by the California Climate Change Center in 2006.

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Executive Order B-30-15. Executive Order B-30-15 was enacted by the Governor on April 29, 2015. Executive Order B-30-15 establishes an interim GHG emission reduction goal for the state of California to reduce GHG emissions to 40 percent below 1990 levels by the year 2030. This Executive Order directs all state agencies with jurisdiction over GHG-emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in Executive Order S-3-05 to reduce GHG emissions to 80 percent below 1990 levels by the year 2050. The Executive Order directs ARB to update its Scoping Plan to address the 2030 goal. It is anticipated that ARB will develop statewide inventory projection data for 2030 and commence efforts to identify reduction strategies capable of securing emission reductions that allow for achievement of the new interim goal for 2030.

Executive Order S-21-09. Executive Order S-21-09 was enacted by Governor Schwarzenegger on September 15, 2009. Executive Order S-21-09 requires that the ARB, under its AB 32 authority, adopt a regulation by July 31, 2010, that sets a 33-percent renewable energy target as established in Executive Order S-14-08. Under Executive Order S-21-09, the ARB will work with the Public Utilities Commission and California Energy Commission to encourage the creation and use of renewable energy sources, and will regulate all California utilities. The ARB will also consult with the Independent System Operator and other load balancing authorities on the impacts on reliability, renewable integration requirements, and interactions with wholesale power markets in carrying out the provisions of the Executive Order. The order requires the ARB to establish highest priority for those resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health.

Executive Order S-01-07. Executive Order S-01-07 was enacted by the Governor on January 18, 2007, and mandates that: 1) a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least ten percent by 2020; and 2) a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. According to the SDCGHGI, the effects of the LCFS would be a ten percent reduction in GHG emissions from fuel use by 2020. On April 23, 2009, the ARB adopted regulations to implement the LCFS.

Executive Order S-21-09; Senate Bill 350. Executive Order S-21-09 was enacted by the Governor on September 15, 2009. Executive Order S-21-09 requires that the ARB, under its AB 32 authority, adopt a regulation by July 31, 2010 that sets a 33 percent renewable energy target as established in Executive Order S-14-08. Under Executive Order S-21-09, the ARB will work with the Public Utilities Commission and California Energy Commission to encourage the creation and use of renewable energy sources, and will regulate all California utilities. The ARB will also consult with the Independent System Operator and other load balancing authorities on the impacts on reliability, renewable integration requirements, and interactions with wholesale power markets in carrying out the provisions of the Executive Order. The order requires the ARB to establish highest priority for those resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health. Senate Bill 350 codified the 33 percent Renewable Portfolio Standard by 2020 and additionally

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expresses the intent of the Legislature for the purposes of the RPS program that the amount of electricity generated per year from eligible renewable energy resources be increased to an amount equal to at least 50 percent by December 31, 2030. Senate Bill 350 required the PUC, by January 1, 2017, to establish the quantity of electricity products from eligible renewable energy resources be procured by each retail seller for specified compliance periods sufficient to ensure that the procurement of electricity products from eligible renewable energy resources achieves 50 percent of retail sales by December 31, 2030.

California Code of Regulations Title 24. Although not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The GHG emission inventory was based on Title 24 standards as of October 2005; however, Title 24 has been updated as of 2008 and standards are set to be phased in beginning in January 2010. The new Title 24 standards are anticipated to increase energy efficiency by 15 percent, thereby reducing GHG emissions from energy use by 15 percent. Energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in greenhouse gas emissions. Therefore, increased energy efficiency results in decreased greenhouse gas emissions.

The GHG emission inventory was based on Title 24 standards as of October 2005; however, Title 24 has been updated as of 2008, 2013, and 2016. The 2016 standards require buildings to be 28 percent more energy-efficient than 2013 standards.

State Standards Addressing Vehicular Emissions. California Assembly Bill 1493 (Pavley) enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by ARB would apply to 2009 and later model year vehicles. ARB estimated that the regulation would reduce climate change emissions from light duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030. Once implemented, emissions from new light-duty vehicles are expected to be reduced in San Diego County by up to 21 percent by 2020.

The ARB has adopted amendments to the Pavley regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016. The amendments, approved by the ARB Board on September 24, 2009, are part of California's commitment toward a nation-wide program to reduce new passenger vehicle GHGs from 2012 through 2016, and prepare California to harmonize its rules with the federal rules for passenger vehicles. Implementation of the Pavley II standards will commence in 2017 and cover vehicles manufactured from 2017 through 2025. Based on information from the ARB (ARB 2011), the Pavley II program (now referred to as the "Advanced Clean Cars" program) would reduce GHG emissions from the fleet by three

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percent by 2020, and by 12 percent by 2025, with continuing reductions in emissions of 27 percent by 2035 and 33 percent by 2050.

Local Regulations and Standards

The County has adopted its General Plan Update (County of San Diego 2010), which provides smart growth and land use planning principles designed to reduce VMT and result in a reduction in GHG emissions. As discussed in the General Plan Update, climate change and GHG reduction policies are addressed in plans and programs in multiple elements of the General Plan. The strategies for reduction of GHG emissions in the General Plan Update are as follows:

- Strategy A-1: Reduce vehicle trips generated, gasoline/energy consumption, and greenhouse gas emissions.
- Strategy A-2: Reduce non-renewable electrical and natural gas energy consumption and generation (energy efficiency).
- Strategy A-3: Increase generation and use of renewable energy sources.
- Strategy A-4: Reduce water consumption.
- Strategy A-5: Reduce and maximize reuse of solid wastes.
- Strategy A-6: Promote carbon dioxide consuming landscapes.
- Strategy A-7: Maximize preservation of open spaces, natural areas, and agricultural lands.

The General Plan Update also includes climate adaptation strategies to deal with potential adverse effects of climate change. The climate adaptation strategies include the following:

- Strategy B-1: Reduce risk from wildfire, flooding, and other hazards resulting from climate change.
- Strategy B-2: Conserve and improve water supply due to shortages from climate change.
- Strategy B-3: Promote agricultural lands for local food production.
- Strategy B-4: Provide education and leadership.

The County has also implemented a number of outreach programs such as the Green Building Program, lawn mower trade-in program, and reduction of solid waste by recycling to reduce air quality impacts as well as GHG emissions.

The County is working on developing a Climate Action Plan that will include a baseline GHG Inventory; GHG reduction targets and an analysis of the gap that would need to be filled to meet statewide goals set forth in State legislation; GHG reduction measures; and a recommended method(s) for analysis of projects subject to CEQA.

2.4.2 Analysis of Project Effects and Determination as to Significance

2.4.2.1 *Guidelines for Determination of Significance*

According to the California Natural Resources Agency, “due to the global nature of GHG emissions and their potential effects, GHG emissions would typically be addressed in a cumulative impacts analysis.” According to Appendix G of the CEQA Guidelines, the following criteria may be considered to establish the significance of GCC emissions:

Would the project:

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

2.4.2.2 *1994 East Otay Mesa Specific Plan EIR*

The 1994 EIR did not include an analysis of greenhouse gas emissions.

2.4.2.3 *2000 East Otay Mesa Specific Plan Sunroad Centrum SEIR*

The 2000 SEIR did not include an analysis of greenhouse gas emissions.

2.4.2.4 *2012 Sunroad Otay Tech Centre Addendum*

In 2012, an Addendum was prepared for the Sunroad Otay Tech Centre project. A Global Climate Change Evaluation was prepared for the Sunroad Otay Tech Centre project by Scientific Resources Associated (November 16, 2010). The analysis in the report concluded that greenhouse gas emissions impacts would be less than significant. Additionally, the project would reduce emissions of GHGs by 34.7 percent and would be consistent with the goals of AB 32. Therefore, no new mitigation was identified in the 2012 Addendum.

2.4.2.5 *Proposed Project*

GHG emissions associated with the proposed Project were estimated separately for six categories of emissions: (1) construction; (2) area sources; (3) energy use, including electricity and natural gas usage; (4) water consumption; (5) solid waste handling; and (6) transportation.

2.4 Greenhouse Gas Emissions and Energy

The Project site is currently undeveloped and includes disturbed areas and native vegetation. Natural vegetation and soils temporarily store carbon as part of the terrestrial carbon cycle. Minor amounts of GHG emissions may be associated with intermittent on-site activities (e.g., vehicle use). The carbon sequestration loss calculations are based on the biological survey report for the Project site. Table 2.4-5, *East Otay Mesa Specific Plan Amendment On-site Vegetation*, presents a summary of the existing on-site vegetation, and the classification within the CalEEMod model to calculate sequestration loss. Based on the Project site's current conditions and the absence of development, existing site GHG emissions are negligible.

Conformance with Greenhouse Gas Thresholds

Guideline for the Determination of Significance:

Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction Greenhouse Gas Emissions

Construction GHG emissions include emissions from heavy construction equipment, truck traffic, and worker trips. Specific information on construction schedule and activities is not known at this time. Therefore, emissions were calculated using the CalEEMod Model (CalEEMod Version 2016.3.1), based on the default assumptions within the model, which assumes a construction schedule and tempo based on the size of the development. Table 2.4-6, *Assumed Construction Schedule*, presents the assumed construction schedule for the Project.

The total construction emissions were estimated to be 17,485 metric tons of CO₂e. This analysis follows recommendations by the SCAQMD for purposes of evaluating construction-related GHGs under CEQA. Specifically, emissions are amortized over 20 years and added to operational emissions, as appropriate. Amortized over 20 years, construction would contribute 874 metric tons per year of CO₂e emissions. These emissions were added to the operational GHG emissions to evaluate their significance.

Operational Greenhouse Gas Emissions

Operational GHG emissions were calculated using the CalEEMod Model, with adjustments to account for site-specific conditions for buildout year of 2028.

Area Source Emissions. The CalEEMod Model calculates emissions associated with area sources, including landscaping equipment and hearth (fireplace) use. For this analysis, it was assumed that 1,000 residential units would include a natural gas fireplace, with the remaining 2,158 units to be constructed without fireplaces.

Energy Use Emissions. Energy use generates GHGs through emissions from power plants that generate electricity as well as emissions from natural gas usage at the

2.4 Greenhouse Gas Emissions and Energy

facility itself. The CalEEMod model includes energy intensity factors for utilities that are based on emission factors for electricity based on Power Utility Protocol reports submitted to the California Climate Action Registry (CCAR) with the most recent years around 2006-2008 or from the Local Government Organizations Protocol. Implementation of the RPS will affect indirect GHG emissions associated with electricity use for the proposed Project because electricity will be purchased from San Diego Gas and Electric. Based on implementation of RPS mandates, it was assumed that the state of California would meet a goal of 46.6 percent RPS by 2028, the buildout year. At a minimum, buildings would meet the energy efficiency requirements of Title 24 as of 2013, which results in a 21.8 percent decrease in electricity use over Title 24 as of 2008 and 16.8 percent decrease in natural gas use over Title 24 as of 2008 for non-residential uses, and a 23.3 percent decrease in electricity use over Title 24 as of 2008 and 3.8 percent decrease in natural gas use over Title 24 as of 2008 for multi-family residential units. These decreases in energy use were accounted for in the model. The buildings would be constructed post-2016 and would therefore be required to meet the requirements of Title 24 as of 2016. According to the California Energy Commission (CEC 2015), Title 24 as of 2016 would improve residential energy efficiency by 28 percent and non-residential energy efficiency by five percent.

It was also assumed that the residences would be equipped with EnergyStar appliances. The reductions for EnergyStar appliances was accounted for within the CalEEMod model under Energy Mitigation.

Water. Water use and energy use are often closely linked. The provision of potable water to residential and commercial users consumes large amounts of energy associated with five stages: source and conveyance, treatment, distribution, end use, and wastewater treatment. Water use is calculated based on the CalEEMod model defaults. Emission factors for electricity are adjusted within the CalEEMod Model to account for implementation of the RPS, because the default CalEEMod model emission factors for electricity are not adjusted for the RPS. GHG emissions assume that low-flow fixtures would be used, and that water-efficient irrigation systems would be employed that would reduce outdoor water use by 6.1 percent (CalEEMod default mitigation measure).

Solid Waste. The disposal of solid waste produces GHG emissions from anaerobic decomposition in landfills, incineration, transportation of waste, and disposal. Solid waste generation rates were estimated from CalEEMod Model, and GHG emissions from solid waste management were estimated using the model, assuming landfilling of solid waste with flaring. AB 341 sets forth a legislative declaration that it is the policy goal of the state that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020. The County achieves a high diversion rate currently and is working on developing a high diversion plan to meet the 75 percent goal. Jurisdictions were required to meet 50 percent reduction goal under AB 75 by the year 2000. Solid waste generation rates reflect current solid waste generation rates and diversion rates and are adjusted to account for 75 diversion rates. [If the current solid waste diversion rate is 50 percent within CalEEMod, adjusting the

2.4 Greenhouse Gas Emissions and Energy

remaining solid waste disposal rates within the model by 50 percent accounts for 75 percent diversion (50 percent baseline diversion + 25 percent additional diversion = 75 percent diversion)].

Transportation. Several regulatory initiatives have been passed to reduce emissions from on-road vehicles, as discussed in 2.4.1.4. The Emissions Factors (EMFAC) 2014 emission factors, which are included in CalEEMod Version 2016.3.1 were used in the analysis. The EMFAC2014 emission factors include reductions in GHG emissions for the Pavley I and Advanced Clean Cars programs.

Trip generation rates from the Traffic Impact Analysis – East Otay Mesa Specific Plan Amendment were used to calculate emissions associated with vehicle trips generated by the proposed Project. VMT were calculated based on the CalEEMod Model assumptions. To account for the mix of uses at the site, which is a Project design feature, the reduction in VMT was calculated based on the land use index as recommended by the California Association of Air Pollution Control Officers Association (CAPCOA). The land use index indicates that the mix of uses results in a reduction in VMT of 15.04 percent. The 15.04 percent reduction was applied to the emissions for both the unmitigated and mitigated conditions, because the mix of uses is a feature of the Project. Table 2.4-7, *Proposed Project Design Features to Reduce GHG Emissions*, presents a summary of the Project design features that were included in this analysis to reduce GHG emissions.

Service Population. The site residential service population was calculated based on the SANDAG population projections for residential population in the Otay Community Plan Area for 2030, for an average of 2.87 residents per dwelling unit for a total of 9,063 residents. The occupational service population was calculated based on the City of San Diego's Jobs-Housing Nexus Study (Keyser Marston 2013). While the analysis evaluated jobs and housing within the City of San Diego, it represents the most recent regional data on employment by land use. Based on the City of San Diego's Jobs-Housing Nexus study, Research and Development/Manufacturing/Industrial land uses such as that proposed for the Technology Park portion of the Project would generate 1 job per 500 square feet for a total of 1,530 jobs. Retail uses would generate 1 job per 350 square feet for a total of 223 jobs. No data were available for employees for the park uses; therefore, park employees were not considered in the service population calculation. The total service population for the Otay 250 Sunroad - East Otay Mesa Business Park Specific Plan Amendment Project is 10,816.

The Project has been evaluated on the basis of a buildout year of 2028 efficiency metric of 3.0 metric tons per service population with a total of 37,554 CO₂ equivalent emissions. As shown in Table 2.4-8 *Summary of Project's Estimated Greenhouse Gas Emissions with GHG Reduction Measures- Buildout 2028*, the Project would not meet this efficiency metric and would emit 3.5 metric tons per service population. GHG impacts would, therefore, be significant.

2.4 Greenhouse Gas Emissions and Energy

Conformance with Applicable Plans, Policies, or Regulations

Guideline for the Determination of Significance:

Would the Project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Consistency with Applicable Plans

As stated above, the proposed Project would emit 3.5 metric tons per service population and, therefore, would not meet the efficiency metric of 3.0 metric tons per service population. Without mitigation, the Project would not be consistent with the following applicable plans.

- ARB Scoping Plan – Because the proposed Project would not meet the efficiency metric without implementation of mitigation measures, the Project would not be in compliance with applicable regulations adopted by the ARB and other regulatory agencies to implement the Scoping Plan pursuant to AB 32.
- Executive Order B-30-15 and SB 32 – The proposed Project would achieve substantial progress toward meeting the targets of Executive Order B-30-15 and S-3-05 for milestone years 2030 and 2050 and SB 32 by further reducing GHG emissions from the Project site through the Project design features. However, the proposed Project would not meet the efficiency metric without implementation of mitigations measures.

Without implementation of mitigation measures (later discussed in Section 2.4.5, the Project would not meet the efficiency metric of 3.0 metric tons CO₂e per service population, would not be consistent with the goals of Executive Order B-30-15 and SB 32 that requires the state to reduce its GHG emissions to 40 percent below 1990 levels by 2030, and would not be consistent with the ARB Scoping Plan. This impact would be significant.

The Project would be consistent with the following applicable plans.

- Executive Order S-3-05 – The proposed Project, through implementation of Project design features and compliance with vehicle standards, would enable achievement of the statewide goal of reducing GHG emissions to 1990 levels by 2020, and 80 percent below 1990 levels by 2050.
- Executive Order S-21-09 and SB 350 – The proposed Project would purchase power from San Diego Gas and Electric, which is developing its renewable portfolio standard in accordance with state mandates.
- California Code of Regulations Title 24 – The proposed Project would comply with the then-applicable Title 24 standards, thereby demonstrating a commitment to the energy efficient design, construction and operation of residential and non-residential structures.

2.4 Greenhouse Gas Emissions and Energy

- State Vehicle Standards – Vehicles operating within the proposed Project would meet Pavley and LCFS standards to the extent required by law.
Senate Bill 375 – The proposed Project is part of a master-planned community that provides a mix of uses serving the community, consistent with the general objectives of SB 375, as discussed below.

SANDAG’s inclusion of the proposed land use development on the Project site in the Sustainable Communities Strategy’s forecasted development pattern for the region (see Gov. Code, §65080(b)(2)(B)(vii)) is consistent with the fact that SANDAG was required to utilize the “most recent planning assumptions considering local general plans and other factors” when preparing the Sustainable Communities Strategy (Gov. Code, §65080(b)(2)(B)). The Otay 250 – Sunroad East Otay Mesa Business Park Specific Plan Amendment project (i.e., the proposed Project) is part of the Otay Subregional Plan, as adopted in 2011. The County and other regional planning agencies (i.e., SANDAG) have been anticipating development on the Project site since that time.

Additionally, for purposes of SB 375’s underlying policy goals, it is important to recognize that the proposed Project is part of the planned and approved East Otay Mesa Business Park Specific Plan community, which contains a mix of residential, commercial, civic, recreational, and public facilities, all of which – when viewed from an integrated perspective – reduce the amount of vehicle miles traveled and corresponding GHG emissions. The proposed Project would further reduce the amount of vehicle miles traveled by incorporating into the Specific Plan an increase in residential units at high densities mixed with supporting retail and employment uses, adding to what was previously a primarily light industrial/technology center to create a mixed-use village setting.

In addition to being part of a larger Specific Plan area, the proposed Project itself contributes a more integrated and balanced mix of uses, including community-serving commercial, light industrial employment uses, a 50.3-acre open space preserve, and trail amenities. The Project’s mix of uses allows for the Project to internally capture approximately 15.04 percent of all vehicle trips (i.e., these trips remain within the boundaries of the Project site). Further, the Project’s mix of land uses, including residential in conjunction with the retail and employment, is coupled with an integrated pathway and trail plan and traffic calming features along internal streets and roads that promote a pedestrian experience for the Project’s residents and visitors and facilitate non-vehicular travel, consistent with SB 375.

- County General Plan Policies: Policy COS-14.1 (Land Use Development), Policy COS-14.2 (Villages and Rural Villages), Policy COS-14.3 (Sustainable Development), Policy COS-15.1 (Design and Construction of New Buildings), COS-15.4 (Title 24 Energy Standards), and COS-19.1 (Sustainable Water Supply – Sustainable Development Practices) – The Project would be consistent with the County’s General Plan policies that are designed to reduce GHG

2.4 Greenhouse Gas Emissions and Energy

emissions (Policies COS-14.1, COS-14.2, COS-14.3, COS-15.1, COS-15.4, and COS-19-1) through implementation of the Project design features described above and detailed in Chapter 1, *Project Description*, of this EIR. With implementation of the identified design features and mitigation measures identified in Section 2.4.4 below, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Comparison with Existing Entitlement

If constructed as currently approved, the East Otay Mesa Specific Plan Area's existing entitlement would result in emissions of GHGs. The existing entitlement includes 27.37 acres of approved commercial uses (383,180 square feet) and 130.18 acres of approved technology park uses (1,562,200 square feet). The service population is based on the employment of the existing entitlement and was calculated as 4,219. Table 2.4-9, *Summary of Existing Entitlement's Estimated Greenhouse Gas Emissions with GHG Reduction Measures-Buildout 2028*, presents a summary of the emission from the existing entitlement and the existing entitlement's efficiency, assuming buildout in 2028.

As shown in Table 2.4-9, the CO₂e per service population of the existing entitlement is far higher than the CO₂e per service population of the proposed Project. The proposed Project includes a mix of uses and would also site residential uses in an area that is an employment center, reducing VMT within the Otay Mesa area. Therefore, the Project represents an increase in efficiency relative to GHG emissions per service population over the existing entitlement.

2.4.3 Cumulative Impact Analysis

Table 1-6, *Cumulative Projects List*, provides a summary of all the cumulative projects along with their identified impacts to each of the environmental issue areas addressed by this SEIR. By nature, greenhouse gas and global climate change evaluations are a cumulative study, which takes into account the entirety of the immediately surrounding area and the region as a whole. Therefore, the preceding analysis analyzes cumulative impacts associated with greenhouse gas emissions.

2.4.4 Significance of Impacts Prior to Mitigation

The proposed Project would result in a net increase in emissions of GHGs from construction and operations that would exceed the 2028 efficiency metric of 3.0 metric tons CO₂e per service population. The proposed Project would emit 3.5 metric tons per service population and, therefore, would not meet the efficiency metric of 3.0 metric tons per service population (**Impact GHG-1**). Thus, the following significant impact related to greenhouse gas emissions would occur with Project implementation:

2.4 Greenhouse Gas Emissions and Energy

Impact GHG-1: Emissions of GHGs would exceed the efficiency metric.

2.4.5 Mitigation

Because emissions of GHGs would exceed the identified efficiency metric, impacts would be significant. For purposes of the GHG analysis, certain features of the Project have been considered mitigation measures and are listed below.

Energy Efficiency

Measure GHG-1: The Project buildings will exceed Title 24 as of 2016 by 20 percent. This measure was included in the mitigation measures in the CalEEMod Model.

M GHG-2: The Project will include photovoltaic solar panels (or their equivalent, as approved by the Planning and Development Services Director) designed to provide 50 percent of the Project's commercial use electricity needs, and 50 percent of the residential dwelling units shall include photovoltaic solar panels (or their equivalent, as approved by the Planning and Development Services Director) to provide those residential dwelling units' entire electricity needs. This measure was included in the CalEEMod model under Renewable Energy.

2.4.6 Conclusion

The proposed Project would result in a net increase in emissions of greenhouse gases during both the construction phase and operational phase of the Project (**Impact GHG-1**). The Project would implement Mitigation Measures GHG-1 and GHG-2 that would reduce GHG emissions to the extent feasible. Certain features of the Project have been considered mitigation measures, as those items go above and beyond what is calculated in CalEEMod and, with implementation, would reduce GHG emissions generated by the Project. Table 2.4-10, *Summary of Proposed Project's Estimated Greenhouse Gas Emissions with Project Design Features and Mitigation Measures – Buildout 2028*, presents the results of the GHG calculations with mitigation measures included as described above. As shown in Table 2.4-10, with mitigation, the Project would meet the efficiency metric of 3.0 metric tons per service population. The GHG efficiency of the Project would therefore meet the efficiency metric of 3.0 metric tons per service population, and GHG impacts would be less than significant.

Because the proposed Project is consistent with the applicable plans, policies, and regulations adopted for regulation of GHG emissions, the Project would not:

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

2.4 Greenhouse Gas Emissions and Energy

Because the Project would meet the efficiency metric of 3.0 metric tons CO₂e per service population with mitigation, the Project would be consistent with the goals of Executive Order B-30-15 and SB 32 that requires the state to reduce its GHG emissions to 40 percent below 1990 levels by 2030. This impact is less than significant.

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-1. STATE OF CALIFORNIA GHG EMISSIONS BY SECTOR

Sector	Total 1990 Emissions (MMTCO ₂ e)	Percent of Total 1990 Emissions	Total 2013 Emissions (MMTCO ₂ e)	Percent of Total 2013 Emissions
Agriculture	23.4	5%	36.21	8%
Commercial	14.4	3%	15.43	3%
Electricity Generation	110.6	26%	90.45	20%
Forestry (excluding sinks)	0.2	<1%	Not reported	
Industrial	103.0	24%	92.68	20%
Residential	29.7	7%	28.11	6%
Transportation	150.7	35%	169.02	37%
Recycling and Waste			8.87	2%
High GWP Gases			18.50	4%
Forestry Sinks	(6.7)		Not reported	

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-2. GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES OF GHGS

GHG	Formula	100-Year Global Warming Potential	Atmospheric Lifetime (Years)
Carbon Dioxide	CO ₂	1	Variable
Methane	CH ₄	28	12
Nitrous Oxide	N ₂ O	265	121
Sulfur Hexafluoride	SF ₆	23,500	3,200
Hydrofluorocarbons	HFCs	100 to 12,000	1 to 100
Perfluorocarbons	PFCs	7,000 to 11,000	3,000 to 50,000
Nitrogen Trifluoride	NF ₃	16,100	500

Source: First Update to the Climate Change Scoping Plan, ARB 2014

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-3. SAN DIEGO COUNTY 2006 GHG EMISSIONS BY CATEGORY

Sector	Total Emissions (MMTCO₂e)	Percent of Total Emissions
On-Road Transportation	16	46%
Electricity	9	25%
Natural Gas Consumption	3	9%
Civil Aviation	1.7	5%
Industrial Processes & Products	1.6	5%
Other Fuels/Other	1.1	4%
Off-Road Equipment & Vehicles	1.3	4%
Waste	0.7	2%
Agriculture/Forestry/Land Use	0.7	2%
Rail	0.3	1%
Water-Born Navigation	0.13	0.4%

Source: EPIC's SDCGHGI, 2008.

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-4. DERIVATION OF EFFICIENCY METRIC, 2028 BUILDOUT

Emissions, MT/yr ^a	187.02
Population	43,424,440
Employment (assuming 1.491% change as from 2012-2022) ^c	19,738,382
Total	63,162,822
Metric Tons/Service Population	3.0

^a Assuming 5.2% reduction per year from 2020 baseline levels of 286.70 MT CO₂e

^b California Department of Finance, Demographic Research Unit Report P-2, State and County Population Projections by Race/Ethnicity and Age (5-year groups) 2010 through 2060 (as of July 1); December 15, 2014

^c California Department of Finance, Employment Development Department Industry Employment Projections, Labor Market Information Division, 2010-2020; May 23, 2012, assuming 1.491% growth in employment

2.4 Greenhouse Gas Emissions and Energy

**TABLE 2.4-5. EAST OTAY MESA SPECIFIC PLAN AMENDMENT ON-SITE
VEGETATION**

Habitat	Acres On Site	CalEEMod Category
Wetland Habitat Types		
Disturbed Wetland ¹	0.83	Wetlands
Non-Native Riparian	0.51	Scrub
Upland Habitat Types		
Native Grassland	1.65	Grassland
Non-Native Grassland ¹	239.91	Grassland
Other Upland Habitats/Land Cover		
Developed Land	2.97	Others
Disturbed Habitat	7.26	Others
Total	253.13	

¹The project would preserve 0.3 acres of wetlands and 51.33 acres of grassland.

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-6. ASSUMED CONSTRUCTION SCHEDULE¹

Project Element	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	TOTAL
Technology Park (square feet)		95,625	95,625	95,625	95,625	95,625	95,625	95,625	47,813	47,812	765,000 sq ft
Residential (units)	875	697	337	837	312	100					3,158 units
Retail (square feet)						78,000					78,000 sq ft
Park (acres)	8	10		9							27 acres

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-7. PROPOSED PROJECT DESIGN FEATURES TO REDUCE GHG EMISSIONS

Strategy to Reduce GHG Emissions	Description	Emission Reduction	Basis for Emission Reduction
Land Use and Community Design			
Mixed Use Development	The East Otay Mesa Specific Plan Amendment provides a mix of uses at the site, including residential, retail, and industrial/employment uses.	Based on CAPCOA's <i>Quantifying Greenhouse Gas Mitigation Measures</i> , the land use index for the Project projects a 15.04% reduction in VMT.	CAPCOA
Electric Vehicle Parking	Non-residential and multi-residential units will be conditioned to provide electric vehicle parking. The electric vehicle parking will conform with applicable building code requirements in place at the time of construction.	Because EMFAC2014, which is included in CalEEMod 2016, accounts for penetration of electric vehicles into the fleet, no additional reductions were taken.	
Provide Bike Parking in Non-residential and Multi-Unit Residential Projects	Non-residential and multi-residential units will be conditioned to include bicycle parking. The bicycle parking will conform with applicable building code requirements in place at the time of construction.	Because the reduction in VMT is not quantifiable at this time, no additional reductions were taken.	
Provide Pedestrian Network Improvements	The project will be designed with non-contiguous sidewalks to provide a pedestrian network throughout.	No credit was taken for this measure in the GHG calculations for the mitigated emission calculations.	
Increase Transit Accessibility	The project will provide a new MTS bus stop. The project is within 0.5 miles of MTS bus route 905, which currently provides hourly service to the project area.	CalEEMod model reductions	CalEEMod Model
Traffic Calming Measures	The project will include traffic calming measures on a minimum of 25% of internal streets and 25% of internal intersections.	This measure was accounted for by reducing GHG emissions from vehicles by 0.25% per CAPCOA	CAPCOA 2010
Energy Efficiency			

2.4 Greenhouse Gas Emissions and Energy

Limited Outdoor Lighting	The project will limit outdoor lighting requirements. Outdoor lighting will be limited in accordance with the dark skies policy, consistent with applicable code requirements in place at the time of construction	Because the reduction in GHGs is not quantifiable, no additional reductions were taken.	
ENERGYSTAR Appliances	Indoor residential appliances will meet the requirements of Title 24 at the time of construction, which is assumed to be EnergyStar for residential units.	CalEEMod model reductions	CalEEMod Model
High Efficiency Lighting	The project will be equipped with high efficiency public street and area lighting that will reduce energy requirements for lighting by 5 percent.	CalEEMod model reductions	CalEEMod Model
LED Traffic Lights	Traffic lights installed by the project will be LED traffic lights.	Because the reduction in GHGs is not quantifiable, no additional reductions were taken.	
Programmable Thermostat Timers	The project will include installation of programmable thermostat timers in all buildings.	Because the reduction in GHGs is not quantifiable, no additional reductions were taken.	
Water Conservation			
Low-Flow Fixtures	Indoor plumbing would include low-flow fixtures as required by Title 24 building codes in effect at the time of construction.	CalEEMod model reductions	CalEEMod Model
Water-Efficient Irrigation Systems	The project will install water-efficient irrigation systems that meet at least 6.1% reduction in outdoor water use.	CalEEMod model reductions	CalEEMod Model
Plant Native or Drought-Resistant Trees and Vegetation	All public areas will be planted with native or drought-resistant trees and vegetation.	Because the reduction in GHGs is not quantifiable, no additional reductions were taken.	
Water-Efficient Landscapes	The project will be designed to use water-efficient landscapes.	Because the reduction in GHGs is not quantifiable, no additional reductions were taken.	
Building and Site Design			
California 2013 Title 24 Building Energy Efficiency Standards	All buildings would be designed to meet the California 2013 Title 24 Building Energy Efficiency Standards at a minimum. By the time buildings are constructed, it is likely that updated, more stringent energy	CalEEMod 2016.3.1 included Title 24 as of 2013.	CalEEMod model

2.4 Greenhouse Gas Emissions and Energy

Strategy to Reduce GHG Emissions	Description	Emission Reduction	Basis for Emission Reduction
	efficiency standards would be adopted.		
Fireplaces	The residences will be constructed either with no fireplace or with natural gas fireplaces, 1,000 of the units will include natural gas fireplaces, with the remaining 2,158 units to be constructed without fireplaces.	CalEEMod Model reductions	CalEEMod Model
Solid Waste Diversion	The project would include solid waste diversion practices in accordance with AB 341, which requires 75% solid waste diversion by 2030. Current solid waste diversion rates of 52.6% for multifamily dwellings and 50% for non-residential uses were assumed in the analysis.	75% diversion rates resulting in associated GHG emissions reductions.	AB 341 requirements

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-8. SUMMARY OF PROPOSED PROJECT'S ESTIMATED GREENHOUSE GAS EMISSIONS WITH PROJECT DESIGN FEATURES- BUILDOUT 2028

Emission Source	Annual Emissions (Metric tons/year)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Operational Emissions				
Area Sources	326	0.0417	0.0053	329
Electricity Use	4,463	0.1858	0.0372	4,478
Natural Gas Use	3,075	0.0589	0.0564	3,092
Water Consumption	987	10.1619	0.2463	1,337
Solid Waste Handling	245	14.4607	0.0000	650
Vehicles	26,730	1.3084	0.0000	26,767
Amortized Construction	874	0.0000	0.0000	874
Amortized Land Use Change	28	0.0000	0.0000	28
Total	36,728	26.2174	0.40.3452	37,554
Global Warming Potential Factor	1	28	265	
CO ₂ Equivalent Emissions	36,728	734	92	37,554
TOTAL CO₂ Equivalent Emissions	37,554			
Service Population	10,816			
Metric Tons per Service Population	3.5			
2028 Efficiency Metric	3.0			

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-9. SUMMARY OF EXISTING ENTITLEMENT'S ESTIMATED GREENHOUSE GAS EMISSIONS WITH GHG REDUCTION MEASURES- BUILDOUT 2028

Emission Source	Annual Emissions (Metric tons/year)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Operational Emissions				
Area Sources	0.0343	0.0001	0.0000	0
Electricity Use	4,320	0.1799	0.0360	4,750
Natural Gas Use	1,736	0.0333	0.0318	1,568
Water Consumption	792	10.1860	0.2456	1,206
Solid Waste Handling	237	14.0326	0.0000	315
Vehicles	19,881	1.0089	0	19,909
Amortized Construction	622	0.0000	0.0000	622
Amortized Land Use Change	28	0.0000	0.0000	28
Total	27,615	25.4408	0.3134	28,411
Global Warming Potential Factor	1	28	265	
CO ₂ Equivalent Emissions	27,615	712	83	28,411
TOTAL CO₂ Equivalent Emissions	28,411			
Service Population	4,219			
Metric Tons per Service Population	6.73			
2028 Efficiency Metric	3.0			

2.4 Greenhouse Gas Emissions and Energy

TABLE 2.4-10. SUMMARY OF PROPOSED PROJECT'S ESTIMATED GREENHOUSE GAS EMISSIONS WITH PROJECT DESIGN FEATURES AND MITIGATION MEASURES- BUILDOUT 2028

Emission Source	Annual Emissions (Metric tons/year)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Operational Emissions				
Area Sources	326	0.0417	0.0053	329
Electricity Use	2,160	0.0899	0.0180	2,167
Natural Gas Use	2,636	0.0505	0.0483	2,650
Water Consumption	987	10.1629	0.2465	1,337
Solid Waste Handling	245	14.4607	0.0000	650
Vehicles	24,717	1.2216	0.0000	24,751
Amortized Construction	874	0.0000	0.0000	874
Amortized Land Use Change	28	0.0000	0.0000	28
Total	31,973	26.0273	0.3181	32,786
Global Warming Potential Factor	1	28	265	
CO ₂ Equivalent Emissions	31,973	729	84	32,786
TOTAL CO₂ Equivalent Emissions	32,786			
Service Population	10,816			
Metric Tons per Service Population	3.0			
2028 Efficiency Metric	3.0			