4.3 Climate Change

4.3.1 Summary

Table 15 summarizes the identified environmental impacts, proposed Mitigation Measures, and residual impacts of the proposed project with regard to climate change. Additional detail is provided in Section 4.3.3 (Impact Analysis).

Table 15 Impact and Mitigation Summary: Climate Change

Impact	Mitigation Measures	Residual Impact
Impact CC-1. The proposed project would generate GHG emissions during construction and operation that exceed the applicable efficiency threshold. This impact would be significant but mitigable.	**CC-1 GHG Reduction Plan** Prior to consideration of a Use Permit for the project, the project developer shall prepare a project GHG Reduction Plan to reduce annual GHG emissions over the operational lifetime of the project. The GHG reduction plan shall be capable of maintaining annual emissions from the project at or below 1,225 MT CO_2e per year. If GHG emissions cannot be reduced to 1,225 MT CO_2e per year through compliance with such a plan, the applicant shall purchase carbon offsets in an amount sufficient to achieve annual emissions of 1,225 MT CO2e per year, prior to issuance of grading or building permits. Carbon offsets shall be purchased from a validated source to offset annual GHG emissions. The plan would be implemented on-site by the project applicant and may include, but is not limited to, the following measures. **On-site Emission Reduction Measures** ▪ Installing energy efficient equipment, appliances, heating, and cooling exceeding California Green Building Code standards ▪ Installing renewable energy sources ▪ Implementing energy efficient building design exceeding California Building Code requirements ▪ Installing green roofs ▪ Promoting water conservation and recycling, such as through the use of irrigation controllers ▪ Purchasing carbon offsets through an accredited program **Mobile Source Emission Reduction Measures** ▪ Promoting alternative fuel vehicles, such as by providing additional ZEV charging infrastructure and designating parking spaces for ZEV or hybrid vehicles ▪ Providing incentives and outreach for future tenants to promote employee ridesharing and transit use **Monitoring Action:** The GHG Reduction Plan shall be prepared by the applicant and submitted to the Chief of Planning for review and approval prior to consideration of the Use Permit at the Planning Commission. Applicable elements of the GHG Reduction Plan shall be reflected on project site plans prior to approval of grading or building permits and implemented in the project prior to final inspection.	Implementation of Mitigation Measure CC-1 would reduce GHG emission impacts to less than significant.

Impact	Mitigation Measures	Residual Impact
Impact CC-2. The proposed project would conflict with local and statewide policies and regulations intended to reduce GHG emissions. Impacts would be significant but mitigable.	Implementation of Mitigation Measure **CC-1 GHG Reduction Plan** is required.	Implementation of Mitigation Measure CC-1 would reduce impacts to less than significant.

4.3.2 Setting

a. Climate Change and Greenhouse Gases

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate-related dynamics such as wind patterns, precipitation, and storms over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred because it conveys that there are other changes in addition to rising temperatures. The baseline against which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. Per the United Nations Intergovernmental Panel on Climate Change (IPCC 2014), the understanding of anthropogenic warming and cooling influences on climate has led to a confidence level of 95 percent or greater chance that the global average net effect of human activities has been the dominant cause of warming since the mid-20th century (IPCC 2014).

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHG). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such a hydrofluorocarbons (HFC) and perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Observations of CO_2 concentrations, globally averaged temperature, and sea level rise are generally well within the range of the extent of the earlier IPCC projections. The recently observed increases in CH_4 and N_2O concentrations are smaller than those assumed in the scenarios in the previous assessments. Each IPCC assessment has used new projections of future climate change that have become more detailed as the models have become more advanced.

Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (USEPA 2017a). Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of gas emissions, referred to as "carbon dioxide equivalent" (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, methane has a GWP of 28, meaning its global warming effect is 28 times greater than carbon dioxide on a molecule per molecule basis within a 100-year timescale (IPCC 2014).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHGs, the surface of the earth would be about 34° Celsius cooler (CalEPA 2006). However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. The following discusses the primary GHGs of concern.

Carbon Dioxide

The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tons of carbon in the form of CO_2 are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced (GCRP 2009). CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration, with the first conclusive measurements being made in the last half of the 20th century. Concentrations of CO_2 in the atmosphere have risen approximately by 40 percent since the industrial revolution. The global atmospheric concentration of CO_2 has increased from a pre-industrial value of about 280 ppm to 391 ppm (IPCC 2014), yet as of August 7, 2017, the Mauna Loa Observatory located in Hawaii recorded the monthly average for CO_2 concentrations in July 2017 as 407.07 ppm (NOAA 2017a). The average annual CO_2 concentration growth rate was larger between 1995 and 2005 (average: 1.9 ppm per year) than it has been since the beginning of continuous direct atmospheric measures (1960-2005 average: 1.4 ppm per year), although there is year-to-year variability in growth rates (NOAA 2017b).

Methane

Methane (CH_4) is an effective absorber of radiation, though its atmospheric concentration is less than that of CO_2 and its lifetime in the atmosphere is limited to 10 to 12 years. It has a global warming potential (GWP) approximately 28 times that of CO_2 in a 100-year timeframe. Over the last 250 years, the concentration of CH_4 in the atmosphere has increased by 150 percent (IPCC 2014). Although methane emissions appeared to level off following the late 1990s, atmospheric measurements have shown renewed increases since 2007 (IPCC 2014). Anthropogenic sources of CH_4 include enteric fermentation associated with domestic livestock, landfills, natural gas and petroleum systems, agricultural activities, coal mining, wastewater treatment, stationary and mobile combustion, and certain industrial processes (USEPA 2017a).

Nitrous Oxide

Concentrations of nitrous oxide (N_2O) began to rise at the beginning of the industrial revolution and continue to increase at a relatively uniform growth rate (NOAA 2017b). N_2O is produced by

microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes. Use of these fertilizers has increased over the last century. Agricultural soil management and mobile source fossil fuel combustion are the major sources of N_2O emissions. The GWP of nitrous oxide is approximately 310 times that of CO_2 over a period of 100 years.

Fluorinated Gases (HFCs, PFCs, and SF_6)

Fluorinated gases, such as HFCs, PFCs, and SF_6, are powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are used as substitutes for ozone depleting substances, such as chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC), and halons, which have been regulated since the mid-1980s because of their ozone-destroying potential and are phased out under the Montreal Protocol (1987) and Clean Air Act Amendments of 1990. Electrical transmission and distribution systems account for most SF_6 emissions, while PFC emissions result from semiconductor manufacturing and as a by-product of primary aluminum production. Fluorinated gases are typically emitted in smaller quantities than CO_2, CH_4, and N_2O, but these compounds have much higher GWPs. SF_6 is the most potent GHG the IPCC has evaluated and has a 100-year GWP of 23,900 (United Nations Climate Change [UNCC] 2014).

b. Statewide Greenhouse Gas Emissions Inventory

Globally, approximately 33,733 million metric tons (MMT, or Gigatonnes) of CO_2 were added to the atmosphere through the combustion of fossil fuels in 2014 (USEPA 2017b). CO_2 emissions from fossil fuel combustion and industrial processes contributed about 65 percent of total emissions in 2010. Of anthropogenic GHGs, carbon dioxide was the most abundant accounting for 76 percent of total 2010 emissions. Methane emissions accounted for 16 percent of the 2010 total, while nitrous oxide and fluorinated gases account for 6 and 2 percent respectively (IPCC 2014).

In 2014, the United States emitted 6,586.7 MMT CO_2e, accounting for approximately 16 percent of global carbon emissions (USEPA 2017b). Within the United States, fossil fuel combustion accounted for 93.3 percent of CO_2 emissions in 2015, while CO_2 accounted for approximately 82.2 percent of total U.S. emissions. Between 1990 and 2015, CO_2 emissions from fossil fuel combustion increased from 4,740.3 MMT CO_2e to 5,049.8 MMT CO_2e, representing a 6.5 percent total increase over the 26-year period (USEPA 2017b). Of the total U.S. GHG emissions accounted for in 2015, approximately 29 percent can be attributed to electricity production, 27 percent to transportation, 21 percent to industrial processes, 12 percent to commercial and residential uses, 9 percent to agricultural activities, and 2 percent to landfills (USEPA 2017b).

Based upon the 2017 Edition of the CARB's California Greenhouse Gas Inventory, California produced 440.4 MMT CO_2e in 2015 (CARB 2017b). The major source of GHG in California is transportation, contributing 39 percent of the state's total GHG emissions. Industrial sources are the second largest source of the state's GHG emissions at 23 percent (CARB 2017b). California emissions are due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. The CARB has projected statewide unregulated GHG emissions for the year 2020 will be 509 MMT CO_2e (CARB 2017c). These projections represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

c. Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long term trends have found that each of the past three decades has been warmer than all the previous decades in the instrumental temperature record, and the decade from 2000 through 2010 has been warmest. The global combined land and ocean temperature data show an increase of about 0.89°C (0.69°C and 1.08°C) over the period 1901 to 2012 and about 0.72°C (0.49°C and 0.89°C) over the period 1951 to 2012 when described by a linear trend. Several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations are in agreement that LSAT as well as Sea Surface Temperature (SST) has increased. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC 2014).

According to the CalEPA's *2010 Climate Action Team Biennial Report*, potential impacts of climate change in California 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 (CalEPA 2010). Below is a summary of some of the potential effects that could be experienced in California resulting from climate change.

Sea Level Rise

According to *The Impacts of Sea-level Rise on the California Coast*, prepared by the California Climate Change Center (CCCC) (2009a), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. The study identifies a sea level rise on the California coast over the past century of approximately eight inches. Based on the results of various climate change models, sea level rise is expected to continue. The California Climate Adaptation Strategy (CNRA 2009) estimates a sea level rise of up to 55 inches by the end of the 21st century.

Air Quality

Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore, its indirect effects are uncertain. If higher temperatures are companied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (CCCC 2009b).

Water Supply

Analysis of paleoclimatic data (such as tree ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the western U.S., including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California; however, the

average early spring snowpack in the Sierra Nevada decreased by about 10 percent in the last century, a loss of 1.5 million acre feet of snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern Californian cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record (CCCC 2009a).

This uncertainty complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The Sierra Nevada snowpack provides the majority of California's water supply by accumulating snow during our wet winters and releasing it slowly when we need it during our dry springs and summers. Based upon historical data and modeling, DWR projects that the Sierra Nevada snowpack will experience a 25 to 40 percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack (DWR 2008).

Hydrology

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

Agriculture

California is home to a $30 billion agriculture industry that produced half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality.

Ecosystems and Wildlife

Climate change and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs is likely to accelerate the rate of climate change. Scientists project that the average global surface temperature could rise by 1.0-4.5°F (06.-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent in other regions. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan 2006, Parmesan and Galbraith 2004).

d. Local Effects of Climate Change

While the above discussion identifies the possible effects of climate change at a global and potentially statewide level, regional and local predictions are often based on downscaling statewide models (CalEPA 2010). However, observable effects of climate change have already been witnessed on the environment. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted, and floras are flowering sooner (National Aeronautics and Space Administration [NASA] 2017). For Monterey County, one of the main concerns is sea level rise. Even small amounts of sea level rise make rare floods more common by adding to tides and storm surge (Climate Central 2016). Climate Central, an independent organization of scientists and journalists researching and reporting about climate change and its impact on the public, has projected a three-foot sea level rise in Monterey County by the year 2100, from the 1992 baseline (Climate Central 2016). This translates to an eight percent multi-year risk of at least one flood exceeding three feet from 2016 to 2030, an 80 percent risk from 2016 to 2050, and a 100 percent risk by 2100 (Climate Central 2016).

The Pacific Institute – a global water think tank that endeavors to inform decision-makers on climate change effects such as creating assessments for policy-makers on climate change and its impacts on fresh water supplies – created a map in coordination with Caltrans and the California Energy Commission (CEC) that illustrates sea level rise potential for different sections of California. This *California Flood Risk: Sea Level Rise Monterey Quadrangle* map emphasizes certain areas along the Monterey Peninsula most at risk to rising sea levels and flooding, including coastal Monterey, the western coasts of Pacific Grove, and the mouth of the Carmel River (Pacific Institute 2009). The map also indicates that the southeastern-most corner of the project site would be inundated during a 100-year flood event after sea levels have risen 1.4 meters (approximately 55 inches) (Pacific Institute 2009).

4.3.3 Regulatory Setting

Federal

USEPA Final Rule for GHG Emission Reporting

The United States Supreme Court in *Massachusetts et al. v. Environmental Protection Agency et al.* ([2007] 549 U.S. 05-1120) held that the USEPA has the authority to regulate motor vehicle GHG emissions under the federal Clean Air Act.

The USEPA issued a Final Rule for mandatory reporting of GHG emissions facilities that emit more than 25,000 metric tons (MT) CO_2e per year in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. The first annual reports for these sources were due in March 2011.

On May 13, 2010, the USEPA issued a Final Rule that took effect on January 2, 2011, setting a threshold of 75,000 MT CO_2e per year for GHG emissions. New and existing industrial facilities that meet or exceed that threshold will require a permit after that date. On November 10, 2010, the USEPA published the "PSD and Title V Permitting Guidance for Greenhouse Gases." The USEPA's guidance document is directed at state agencies responsible for air pollution permits under the Federal Clean Air Act to help them understand how to implement GHG reduction requirements while mitigating costs for industry. It is expected that most states will use the USEPA's new

guidelines when processing new air pollution permits for power plants, oil refineries, cement manufacturing, and other large pollution point sources.

Tailoring Rule, Title V Permitting

On January 2, 2011, the USEPA implemented the first phase of the Tailoring Rule for GHG emissions Title V Permitting. Under the first phase of the Tailoring Rule, all new sources of emissions are subject to GHG Title V permitting if they are otherwise subject to Title V for another pollutant and they emit at least 75,000 MT of CO_2e per year. Under Phase One, no sources were required to obtain a Title V permit solely due to GHG emissions. Phase Two of the Tailoring Rule went into effect July 1, 2011. At that time new sources were subject to GHG Title V permitting if the source emits 100,000 MT CO_2e per year, or they are otherwise subject to Title V permitting for another pollutant and emit at least 75,000 MT CO_2e per year.

In 2012, the USEPA issued the final rule that remains the GHG permitting thresholds that were established in Phases One and Two of the GHG Tailoring Rule. These emission thresholds determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

State

The California Air Resources Board (CARB) is responsible for the coordination and oversight of State and local air pollution control programs in California. Various statewide and local initiatives to reduce the State's contribution to GHG emissions have raised awareness about climate change and its potential for severe long term adverse environmental, social, and economic effects.

Assembly Bill 1493

Assembly Bill (AB) 1493 (2002), referred to as "Pavley," requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, USEPA granted the waiver of Clean Air Act preemption to California for its GHG emission standards for motor vehicles beginning with the 2009 model year. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG," will cover 2017 to 2025.

Executive Order S-3-05

In 2005, the Governor issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. EO S-3-05 provides that by 2012, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels (CalEPA 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA 2006). The 2006 CAT Report identified a recommended list of strategies that the state could pursue to reduce GHG emissions. These are strategies that could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light-duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increase recycling, and landfill methane capture, etc.

Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 (essentially a 15 percent reduction below 2005 emission levels; the same requirement as under S-3-05), and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions.

After completing a comprehensive review and update process, the CARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2e. The Scoping Plan was approved by CARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms.

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

Senate Bill 97

SB 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

CARB Resolution 07-54

CARB Resolution 07-54 establishes 25,000 MT of GHG emissions as the threshold for identifying the largest stationary emission sources in California for purposes of requiring the annual reporting of emissions. This threshold is just over 0.0005 percent of California's total inventory of GHG emissions for 2004.

Senate Bill 375

SB 375, signed in August 2008, enhances the State's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from vehicles for 2020 and 2035. In addition, SB 375 directs each of the State's 18 major Metropolitan Planning Organizations (MPO) to prepare a Sustainable Communities Strategy (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010, CARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Monterey Bay Air Resources District (MBARD) was assigned targets of a 0 percent per capita reduction in GHG from transportation sources from 2005 levels by 2020 and a 5 percent per capita reduction in GHGs from transportation sources from 2005 levels by 2035.

Senate Bill 32

On September 8, 2016, the Governor signed Senate Bill 32 (SB 32) into law, extending AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. To meet reduction targets, the 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted policies, such as SB 350 and SB 1383 (see below). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally-appropriate quantitative thresholds consistent with a statewide per capita goal of six MT CO_2e by 2030 and two MT CO_2e by 2050 (CARB 2017).

Senate Bill 350

Adopted on October 7, 2015, SB 350 supports the reduction of GHG emissions from the electricity sector through a number of measures, including requiring electricity providers to achieve a 50 percent renewables portfolio standard by 2030, a cumulative doubling of statewide energy efficiency savings in electricity and natural gas by retail customers by 2030.

Senate Bill 1383

Approved by the governor in September 2016, SB 1383 requires the CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the strategy to achieve the following reduction targets by 2030:

- Methane: 40 percent below 2013 levels
- Hydrofluorocarbons: 40 percent below 2013 levels
- Anthropogenic black carbon: 50 percent below 2013 levels

The bill also requires CalRecycle, in consultation with the state board, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

Senate Bill 97

Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. As previously noted, the adopted State CEQA Guidelines provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, the San Luis Obispo Air Pollution Control District (SLOAPCD) and the San Joaquin Air Pollution Control District (SJVAPCD) have adopted quantitative significance thresholds for GHGs. The MBARD has not adopted any recommended quantitative thresholds of significance for GHG emissions.

Regional

Sustainable Communities Strategy

In accordance with SB 375, the Association of Monterey Bay Area Governments (AMBAG) has prepared a Metropolitan Transportation Plan/ Sustainable Communities Strategy (MTP/SCS) that integrates land use and transportation planning at a regional level to achieve CARB-designated GHG emission reduction targets from passenger vehicles. AMBAG's most recently adopted MTP/SCS is *Moving Forward Monterey Bay 2035*, which was approved in June 2014 and amended in January 2017. AMBAG's 2040 MTP/SCS is scheduled for adoption in June 2018.

Local

Municipal Climate Action Plan

In 2013, Monterey County adopted its *Municipal Climate Action Plan* (MCAP). This MCAP provides descriptions of the steps being taken by Monterey County to reduce greenhouse gas (GHG) emissions associated with its municipal operations. The MCAP also illustrates three potential paths towards the County's goals of reducing GHG emissions to a level that is 15 percent below the 2005 emissions level by 2020, which is consistent with AB 32.

Monterey County General Plan

In addition, the Monterey County General Plan Conservation and Open Space Element include several goals and policies that encourage energy and water conservation techniques and the use of renewable resources. These includes Policy OS-9.1, which encourages the use of solar, wind, and other renewable resources for agriculture, residential, commercial, industrial, and public building use; Policy OS-9.2, which directs development toward cities, Community Areas, and Rural centers where energy expended for transportation and provision of services can be minimized; and Policy OS-9.6, which requires the incorporation of features that reduce energy used for transportation, including pedestrian and bicycle pathways and access to transit.

Monterey Bay Community Power

Monterey Bay Community Power was formed to provide locally-controlled, carbon-free electricity to residents and businesses in Monterey, San Benito and Santa Cruz Counties through the Community Choice Energy (CCE) model established by the State of California. MBCP began serving electricity to businesses in March 2018. Current PG&E customers will be automatically enrolled in MBCP. If the project is served by MBCP, GHG emissions associated with energy use for ongoing operations of the buildings on the site would be significantly less than under the existing PG&E services.

Community Climate Action Plan (CCAP)

Monterey County does not currently have an adopted Community Climate Action Plan.

4.3.4 Impact Analysis

a. Methodology and Significance Thresholds

Methodology

Calculations of CO_2, CH_4, and N_2O emissions are provided to identify the magnitude of potential project effects. The analysis focuses on CO_2, CH_4, and N_2O since these comprise 98.9 percent of all GHG emissions by volume (IPCC 2007) and are the GHG emissions that the project would emit in the greatest quantities. Fluorinated gases, such as HFC, PFCs, and SF_6 were not used in this analysis, as they are primarily associated with industrial processes and the proposed project is for retail development and does not include an industrial component. Emissions of all GHGs are converted into metric tons of carbon dioxide equivalent (MT CO_2e), which provides the mass of CO_2 that would have an equivalent global warming effect as the emission. While minimal amounts of other GHGs (such as chlorofluorocarbons [CFC]) would be emitted, they would not substantially add to the calculated CO_2e amounts. Calculations are based on the California Air Pollution Control Officers Association (CAPCOA) *CEQA & Climate Change* white paper (January 2008).

Construction Emissions

Construction of the proposed project would generate temporary GHG emissions primarily due to the operation of the construction equipment and truck trips. Construction emissions were estimated using CalEEMod based on modeling inputs for the land uses, area of disturbance, and export and import fill volumes, as well as model defaults for construction phase length, equipment used, haul trip lengths, and other parameters. Appendix B provides modeling inputs and results.

To estimate the annual emissions that would result from construction activity associated with the project, annual GHG emissions were quantified in CalEEMod and amortized over 50 years, as recommended by the SLOAPCD. The amortized construction emissions are added to the annual average operational emissions to get the project's total annual emissions.

Operational Emissions

CalEEMod provides operational emissions of CO_2 and CH_4. Emissions from energy use include emission from electricity and natural gas use. The emissions factors for natural gas combustion are based on USEPA's AP-42 (*Compilation of Air Pollutant Emissions Factors*) and CCAR. Electricity Emissions are calculated by multiplying the energy use with the carbon intensity of the utility district per kilowatt hour (CAPCOA 2010). The default electricity consumption values in CalEEMod include the California Energy Commission (CEC) sponsored California Commercial End User Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies.

Operational emissions, calculated in CalEEMod, are related to area sources, waste generation, water use, and mobile sources. Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coatings, utilize standard emission rates from CARB, USEPA, and district –in this case MBARD – supplied emission factor values (CAPCOA 2010). Waste generation emissions are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CAPCOA 2017). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle). Water and wastewater usage are based on the default electricity intensity from the CEC's 2006 Refining

Estimates of Water-Related Energy Use in California, using the average values of Northern and Southern California.

CalEEMod quantifies CO_2 and CH_4 emissions from project vehicle trips. For consistency with the traffic study prepared for the project in December 2017 by Keith Higgins Traffic Engineer (KHTE) (Appendix G), CalEEMod was adjusted to incorporate a trip generation rate of 91.77 trips per 1,000 square feet (sf) for weekdays, and 127.01 trips per 1,000 square feet (sf) for Saturdays for retail uses, as well as a 75 percent primary trip generation rate. Additionally, because CalEEMod does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the CCAR General Reporting Protocol (January 2009) direct emissions factors for mobile combustion, VMT for each trip-generating land use (calculated by CalEEMod based on trip generation rates), and the vehicle fleet mix. N_2O calculations and conversion into MT CO_2e are provided in Appendix B.

A limitation of the quantitative analysis of emissions from mobile combustion is that emission models, such as CalEEMod, evaluate aggregate emissions, meaning that all vehicle trips and related emissions assigned to a project are assumed to be new trips and emissions generated by the project itself. Such models do not demonstrate, with respect to a regional air quality impact, what proportion of these emissions are actually "new" emissions, specifically attributable to the proposed project. For most projects, the main contributor to regional air quality emissions is from motor vehicles; however, the quantity of vehicle trips appropriately characterized as "new" is usually uncertain as traffic associated with a project may be relocated trips from other locales. Therefore, because the proportion of "new" versus relocated trips is unknown, the VMT estimate generated by CalEEMod is used as a conservative, worst-case estimate.

Thresholds of Significance

According to the adopted *State CEQA Guidelines*, impacts related to GHG emissions from the proposed project would be significant if the project would:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution toward an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

The State, MBARD, and Monterey County have not adopted GHG emissions thresholds for land use projects, and no GHG emissions reduction plan with established GHG emissions reduction strategies has yet been adopted. MBARD is evaluating a percentage-based threshold option (MBARD 2013); however, MBARD does not have a formal policy recommending specific thresholds.

Since MBARD has not adopted thresholds, MBARD encourages lead agencies to consider a variety of metrics for evaluating GHG emissions and related Mitigation Measures as they best apply to the specific project (MBARD 2017). MBARD has recommended using the adopted SLOAPCD quantitative threshold for land use projects. As mentioned under Section 4.3.2, *Regulatory Setting*, SLOAPCD, the air district immediately south and adjacent to the MBARD, has adopted quantitative GHG

significance thresholds of 4.9 MT CO_2e per service population per year (SLOAPCD 2012). The service population is the total residents and employees accommodated by a project. For the proposed project, which would consist of commercial and retail uses, the service population would be the number of employees associated with the project, or an estimated 250 people.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Impact CC-1 THE PROPOSED PROJECT WOULD GENERATE GHG EMISSIONS DURING CONSTRUCTION AND OPERATION THAT EXCEED THE APPLICABLE EFFICIENCY THRESHOLD. THIS IMPACT WOULD BE SIGNIFICANT BUT MITIGABLE.

Construction Emissions

Project construction would generate GHG emissions primarily associated with construction vehicle trips. Table 16 summarizes the project's construction emissions as estimated using CalEEMod. As shown therein, construction of the project would emit 492.8 MT CO_2e. Amortized over an expected lifespan of 50 years, construction emissions would total 9.9 MT CO_2e per year.

Table 16 Estimated Construction Emissions of Greenhouse Gases

	Emissions (MT CO_2e)
2018 Emissions	321.1
2019 Emissions	171.7
Total Emissions	492.8
Amortized over 50 years	9.9

See Appendix B for CalEEMod worksheets.
MT = metric tons
CO_2e = carbon dioxide equivalent

Operational Emissions

Operational GHG emissions were estimated for area, energy, waste, water, and mobile CO_2 and CH_4 emissions using CalEEMod, and for mobile N_2O emissions as described above. As shown in Table 17, the project would generate annual emissions of less than 0.1 MT CO_2e from area sources, 391.6 MT CO_2e from energy use, 75.5 MT CO_2e from waste, 7.8 MT CO_2e from water use, and 4,018.6 MT CO_2e from mobile sources. Net operational emissions would total 4,503.3 MT CO_2e per year. This estimate accounts for the project's proximity to transit through the application of Mitigation Measure LUT-5, "Increase Transit Accessibility" in CalEEMod. Nevertheless, this is likely a conservative estimate of future project emissions as CalEEMod does not currently incorporate emission reductions expected to result from recently adopted or anticipated statewide policies included in the 2017 Scoping Plan, such as higher fuel efficiencies and promotion of hybrid and zero-emission vehicles. In addition, as discussed above in Section 4.3.3, *Regulatory Setting,* the project would likely be supplied with carbon-free electricity through Monterey Bay Community Power, which would greatly reduce or eliminate GHG emissions associated with electricity consumption. As shown in Table 17, emissions related to energy consumption, which includes natural gas for space

heating, as well as electricity, comprise approximately 8.7 percent of the project's annual emissions. However, the majority (89 percent) of the project's GHG emissions would result from vehicle trips generated by the project.

Table 17 Combined Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions (MT CO_2e)
Construction (Amortized)	9.9
Operational	
Area	<0.1
Energy	391.6
Solid Waste	75.5
Water	7.8
Mobile	
CO_2 and CH_4	3,838.4
N_2O	180.2
Total	**4,503.3**
Service Population	250
Project Efficiency	18.0 MT CO_2e/service population/year
Threshold	4.9 MT CO_2e/service population/year
Threshold Exceeded?	Yes

Sources: See Appendix B for CalEEMod worksheets and N_2O calculations

The combined annual emissions associated with the proposed project would total an estimated 4,503.3 MT CO_2e per year, which would equate to 18.0 MT CO_2e per year per service population. As mentioned under the Methodology section of this analysis, the most appropriate significance threshold to be applied to the proposed project is SLOAPCD's efficiency threshold of 4.9 MT CO_2e per year. Thus, the project would result in annual GHG emissions that would exceed this significance threshold; this would continue to be true even if all energy consumed was carbon-free, which would result in annual emissions of 16.4 MT CO_2e per year per service population. Therefore, the proposed project would have a significant but mitigable environmental impact due to GHG emissions.

Mitigation Measures

Based on the SLOAPCD's target efficiency threshold level of 4.9 MT CO_2e per person and a service population of 250 people, the project would need to reduce its annual emissions down to 1,225 MT CO_2e to meet the target threshold. As stated above, 89 percent of the project's GHG emissions, or 4,018.6 MT CO_2e, would result from vehicle trips generated by the project. Reducing vehicle trips and vehicle emissions is largely addressed at the regional level and statewide level through land use and transportation policies, such as SB 375, and vehicle emission policies, programs, and incentives, such as the low carbon fuel standard, Clean Cars Program, and ZEV program. While project-level options for reducing vehicle trips are limited, the following Mitigation Measure would help reduce the project's GHG emissions impact.

CC-1 GHG Reduction Plan

Prior to consideration of a Use Permit for the project, the project developer shall prepare a project GHG Reduction Plan to reduce annual GHG emissions over the operational lifetime of the project. The GHG reduction plan shall be capable of maintaining annual emissions from the project at or below 1,225 MT CO_2e per year. If GHG emissions cannot be reduced to 1,225 MT CO_2e per year through compliance with such a plan, the applicant shall purchase carbon offsets in an amount sufficient to achieve annual emissions of 1,225 MT CO2e per year, prior to issuance of grading or building permits. Carbon offsets shall be purchased from a validated[2] source to offset annual GHG emissions.

The plan would be implemented on-site by the project applicant and may include, but is not limited to, the following measures:

ON-SITE EMISSION REDUCTION MEASURES

- Installing energy efficient equipment, appliances, heating, and cooling exceeding California Green Building Code standards
- Installing renewable energy sources
- Implementing energy efficient building design exceeding California Building Code requirements
- Installing green roofing
- Promoting water conservation and recycling, such as through the use of irrigation controllers
- Purchasing carbon offsets through an accredited program

MOBILE SOURCE EMISSION REDUCTION MEASURES

- Promoting alternative fuel vehicles, such as by providing additional ZEV charging infrastructure and designating parking spaces for ZEV or hybrid vehicles
- Providing incentives and outreach for future tenants to promote employee ridesharing and transit use

Monitoring Action

The GHG Reduction Plan shall be prepared by the applicant and submitted to the Chief of Planning for review and approval prior to consideration of the Use Permit at the Planning Commission. Applicable elements of the GHG Reduction Plan shall be reflected on project site plans prior to approval of grading or building permits and implemented in the project prior to final inspection.

Significance After Mitigation

Implementation of Mitigation Measure CC-1 would reduce GHG emission impacts to a less than significant level.

[2] Validated sources are carbon offset sources that follow approved protocols and use third-party verification. At this time, appropriate offset providers include only those that have been validated using the protocols of the Climate Action Registry, the Gold Standard, or the Clean Development Mechanism (CDM) of the Kyoto Protocol. Credits from other sources will not be allowed unless they are shown to be validated by protocols and methods equivalent to or more stringent than the CDM standards. For more information on responsible purchasing of carbon offsets, see the Responsible Purchasing Network's *Responsible Purchasing Guide* at: http://www.responsiblepurchasing.org/purchasing_guides/carbon_offsets/purchasing_guide.pdf .

Threshold 2: Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Impact CC-2 THE PROPOSED PROJECT WOULD CONFLICT WITH LOCAL AND STATEWIDE POLICIES AND REGULATIONS INTENDED TO REDUCE GHG EMISSIONS. IMPACTS WOULD BE SIGNIFICANT BUT MITIGABLE.

Monterey County does not currently have an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. However, the Monterey County General Plan contains four policies intended to reduce GHG emissions from development projects. At the regional level, AMBAG's 2035 MTP/SCS establishes goals and policies to support GHG emission reductions from passenger vehicles. However, the document does not contain specific strategies, goals, or policy objectives that would apply to the project; thus, the project is not evaluated for consistency with the 2035 MTP/SCS.

Table 18 evaluates the project's consistency with applicable policies in the 2010 Monterey County General Plan and illustrates that, as an infill project served by transit; the project would be consistent with applicable General Plan policies.

Table 18 Project Consistency with 2010 Monterey County General Plan

Policy	Project Consistency
OS-9.1. The use of solar, wind and other renewable resources for agricultural, residential, commercial, industrial, and public building applications shall be encouraged.	**Consistent** In order to reduce energy required for water delivery and treatment, the proposed project includes a subsurface irrigation system for its landscaped areas that would be supplied in part by roof runoff from a rainwater harvesting system.
OS-9.2. Development shall be directed toward cities, Community Areas, and Rural Centers where energy expended for transportation and provision of services can be minimized.	**Consistent** The proposed project is located immediately across the street from the existing Crossroads Carmel Shopping Center and would add retail development to an area already oriented for retail development.
OS-9.6. Development shall incorporate features that reduce energy used for transportation, including pedestrian and bicycle pathways, access to transit, and roadway design as appropriate.	**Consistent** The project would be served by public transit (Monterey-Salinas Transit Bus Route 24) and would provide bicycle lockers and bicycle racks.
OS-10.2. Mass transit, bicycles, pedestrian modes of transportation, and other transportation alternatives to automobiles shall be encouraged.	**Consistent** See Policy OS-9.6 consistency analysis above.

As discussed in Section 4.3.3, *Regulatory Setting*, AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020. The SLOAPCD efficiency threshold is designed to achieve reductions consistent with AB 32 statewide GHG reduction goals. As described above, the proposed project would exceed SLOAPCD efficiency thresholds. Thus, the proposed project would conflict with AB 32 policies to reduce GHG emissions.

SB 32 further codified the State's GHG emission reduction target of 40 percent below 1990 levels by 2030. As stated in the 2013 Scoping Plan Update, which maps out how the State will achieve the AB 32 target, and the recently adopted 2017 Scoping Plan, which maps out how the State will achieve the SB 32 target, it is up to local agencies and governments to establish policies and thresholds to ensure land use development is consistent with statewide targets. Although the 2017 Scoping Plan also states that per capita community emissions of no more than 6 MT CO_2e by 2030 and no more

than 2 MT CO_2e by 2050 would be consistent with statewide emission reduction targets, the 2017 Scoping Plan does not provide project-level thresholds for land use development. However, compared to AB 32, GHG emissions targets in SB 32 are more aggressive, and because the project would exceed AB 32, it would also exceed SB 32 policies.

The GHG emissions of the project would conflict with statewide policies adopted for the purpose of reducing the emissions of GHG, such as AB 32. This impact would be potentially significant but mitigable.

Mitigation Measures

The project would incorporate Mitigation Measure CC-1.

Significance After Mitigation

Implementation of Mitigation Measure CC-1 would reduce the project's GHG emissions to avoid exceeding SLOAPCD's project-specific efficiency threshold. The reduction of GHG emissions resulting from the implementation of Mitigation Measure CC-1 would ensure the project's consistency with applicable GHG emission reduction targets and policies. Impacts would be less than significant with implementation of mitigation.

Cumulative Impacts

Impacts associated with GHG emissions are cumulative by nature and understood on a global scale, as the accumulation of GHGs in the atmosphere contributes to climate change. As mentioned above, the vast majority of individual projects do not generate sufficient GHG emissions to create an individual project-specific impact through a direct influence to climate change. Therefore, the issue of climate change typically involves an analysis of whether a project's contribution toward an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (State CEQA Guidelines, Section 15355).

The State, MBARD, and Monterey County have not adopted GHG emissions thresholds to determine if individual projects are cumulatively considerable. Therefore, for the purpose of this analysis, a project which falls below the SLOAPCD impact thresholds discussed above is considered to have a less than significant impact, both individually and cumulatively. As indicated above in Impact CC-1 and CC-2, implementation of Mitigation Measure CC-1 would reduce GHG emissions associated with the proposed project below applicable thresholds. Therefore, the proposed project's GHG impacts would not be cumulatively considerable with mitigation implemented.