This section of provides an analysis of the potential for construction and operation of the proposed project to result in a significant effect on climate change. This section is based, in part, on the Air Quality Impact Assessment prepared by Ambient Air Quality & Noise Consulting in February 2009. The modeling print outs depicting greenhouse gas emission projections are incorporated as **Appendix B**. The reader is referred to Section 3.2, Air Quality, for a discussion of project impacts associated with air quality.

3.13.1 EXISTING SETTING

EXISTING CLIMATE SETTING

Since the early 1990s, scientific consensus holds that the world's population is releasing greenhouse gases (GHG) faster than the earth's natural systems can absorb them. These gases are released as byproducts of fossil fuel combustion, waste disposal, energy use, land-use changes, and other human activities. This release of gases, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), creates a blanket around the earth that allows light to pass through but traps heat at the surface preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

While often used interchangeably, there is a difference between the terms "climate change" and "global warming." According to the National Academy of Sciences, climate change refers to any significant, measurable change of climate lasting for an extended period of time that can be caused by both natural factors and human activities. Global warming, on the other hand, is an average increase in the atmosphere's temperature caused by increased GHG emissions. The use of the term climate change is becoming more prevalent because it encompasses all changes to the climate, not just temperature.

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

Table 3.13.1 provides descriptions of the primary GHGs attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

TABLE 3.13.1
GREENHOUSE GASES

Greenhouse Gas	Description
Carbon Dioxide (CO_2)	Carbon dioxide (CO_2) is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.[1]
Methane (CH_4)	Methane (CH_4) is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years.[2]
Nitrous Dioxide (N_2O)	Nitrous oxide (N_2O) is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years.[3]
Hydrofluorocarbons (HFCs)	Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes of less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years).[4]
Perfluorocarbons (PFCs)	Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF_4), perfluoroethane (C_2F_6), perfluoropropane (C_3F_8), perfluorobutane (C_4F_{10}), perfluorocyclobutane (C_4F_8), perfluoropentane (C_5F_{12}), and perfluorohexane (C_6F1_4). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF_4 and C_2F_6 as byproducts. The estimated atmospheric lifetimes for CF_4 and C_2F_6 are 50,000 and 10,000 years, respectively.[4,5]
Sulfur Hexafluoride (SF_6)	Sulfur hexafluoride (SF_6) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF_6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF_6 produced worldwide. Significant leaks occur from aging equipment and during equipment maintenance and servicing. SF_6 has an atmospheric life of 3,200 years.[4]

Source: [1]USEPA 2011a, [2]USEPA 2011b, [3]USEPA 2010a, [4]USEPA 2010b, [5]EFCTC 2003

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global-warming potential, such as HFCs, PFCs, and SF6, are the most heat absorbent. Methane traps over 21 times more heat per molecule than CO2, and N2O absorbs 310 times more heat per molecule than CO2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO2e), which weight each gas by its global warming potential (GWP). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. **Table 3.13-2** shows the GWPs for different GHGs for a 100-year time horizon.

TABLE 3.13-2
GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Dioxide (N_2O)	310
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs)	6,500
Sulfur Hexafluoride (SF_6)	23,900

Source: California Climate Action Registry 2009

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is a significant emitter of CO_2 in the world and produced 477 million gross metric tons of CO_2 equivalents in 2008 (CARB 2010a). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2008, accounting for 36.4 percent of total GHG emissions in the state (CARB 2010a). This category was followed by the electric power sector (including both in-state and out-of-state sources) (24.3 percent) and the industrial sector (19.3 percent) (CARB 2010a).

EFFECTS OF GLOBAL CLIMATE CHANGE

California can draw on substantial scientific research conducted by experts at various state universities and research institutions. With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state—as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea level rise, and ecological shifts.

Many of these changes are accelerating—locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California will face intensifying climate changes in coming decades (CNRA 2009). Generally, research indicates that California should expect overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased

average temperatures and accelerating sea-level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009).

Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA 2009):

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.
- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer, and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.
- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4 °F (an increase one to three times as large as that which occurred over the entire 20th century).
- By 2100, the models project temperature increases between 3.6 to 9 °F.

According to the 2009 California Climate Adaptation Strategy, the impacts of climate change in California have the potential to include, but are not limited to, the areas discussed in **Table 3.13-3** below.

TABLE 3.13-3
POTENTIAL STATEWIDE IMPACTS FROM CLIMATE CHANGE

Potential Statewide Impact	Description
Public Health	Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures, and these are due to cardiovascular causes and other chronic diseases. The elderly, infants, and socially isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves.
Floods and Droughts	The impacts of flooding can be significant. Results may include population displacement, severe psychosocial stress with resulting mental health impacts, exacerbation of pre-existing chronic conditions, and infectious disease. Additionally, impacts can range from a loss of personal belongings, and the emotional ramifications from such loss, to direct

Potential Statewide Impact	Description
	injury and/or mortality. Drinking water contamination outbreaks in the U.S. are associated with extreme precipitation events. Runoff from rainfall is also associated with coastal contamination that can lead to contamination of shellfish and contribute to food-borne illness. Floodwaters may contain household, industrial, and agricultural chemicals as well as sewage and animal waste. Flooding and heavy rainfall events can wash pathogens and chemicals from contaminated soils, farms, and streets into drinking water supplies. Flooding may also overload storm and wastewater systems, or flood septic systems, also leading to possible contamination of drinking water systems. Drought impacts develop more slowly over time. Risks to public health that Californians may face from drought include impacts on water supply and quality, food production (both agricultural and commercial fisheries), and risks of waterborne illness. As surface water supplies are reduced as a result of drought conditions, the amount of groundwater pumping is expected to increase to make up for the water shortfall. The increase in groundwater pumping has the potential to lower the water tables and cause land subsidence. Communities that utilize well water will be adversely affected by drops in water tables or through changes in water quality. Groundwater supplies have higher levels of total dissolved solids compared to surface waters. This introduces a set of effects for consumers, such as repair and maintenance costs associated with mineral deposits in water heaters and other plumbing fixtures, and on public water system infrastructure designed for lower salinity surface water supplies. Drought may also lead to increased concentration of contaminants in drinking water supplies.
Water Resources	The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century—especially increases in hydrologic variability—will likely intensify in this century. The State can expect to experience more frequent and larger floods and deeper droughts. Rising sea level will threaten the Delta water conveyance system and increase salinity in near-coastal groundwater supplies. Planning for and adapting to these simultaneous changes, particularly their impacts on public safety and long-term water supply reliability, will be among the most significant challenges facing water and flood managers this century.
Forests and Landscapes	Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085. 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.

Source: CNRA 2009

GHG SEQUESTRATION

Carbon is stored in nature within the atmosphere, soil organic matter, ocean, marine sediments and sedimentary rocks, terrestrial plants and fossil fuel deposits. Carbon is constantly changing form on the planet through the a number of processes referred to as the carbon cycle, which includes but is not limited to degradation and burning, photosynthesis and respiration, decay, dissolution. When the carbon cycle transfers more carbon to the atmosphere this can lead to global warming. Over the last 300 years atmospheric levels of carbon have increased by more than 30 percent, of which approximately 65 percent is attributable to fossil fuel combustions and 35 percent is

attributed to deforestation and the conversion of natural ecosystems to agricultural use (Pidwirny 2006).

Carbon stored in plants and rocks is referred to as being sequestered. Within the United States, forest sequestration of carbon off-sets approximately 11 percent of the fossil fuel GHG emissions each year (USDA 2010a). The U.S. Forest Service in partnership with the California Department of Forestry and Fire Protection developed the Center for Urban Forest Research (CUFR) Tree Carbon Calculator (CTCC) to estimate energy reductions, emissions reductions, CO_2 sequestration and Total CO_2 stored within trees based on numerous variables including, but are not limited to, the following: diameter at breast height (or age), climate zone, tree species, and building structure characteristics. The CUFR Tree Carbon Calculator is the only tool approved by the Climate Action Reserve's Urban Forest Project Protocol for quantifying carbon dioxide sequestration from GHG tree planting projects. Based on the climate region and a tree's size or age, the CTCC produces information on: the amount CO_2 stored in the tree due to its growth over many years; CO_2 sequestered during the past year; and dry weight of aboveground biomass that could be utilized if the tree was removed. Based on the estimated tree count and diameter of the trees on the project site, the trees on the project site were estimated to sequester approximately 5,475 metric tons of CO_2 per year and store approximately 82,607 metric tons of CO_2 as shown in **Table 3.13-4**. In addition, according to the U.S. Forest Service, approximately 11.2 metric tons of carbon is stored within one acre of soil. Conservatively assuming that the 870 acres of the project site is covered in soil (no rock outcrops or water), approximately 9,744 metric tons of carbon would be stored within the soil in addition to the 82,607 metric tons of CO2 sequestered by trees on the project site, totaling 92,351 metric tons.

TABLE 3.13-4
ESTIMATED TOTAL CO_2 STORED AND SEQUESTERED WITHIN EXISTING TREES

DBH (Inches)	Total # of Trees	Percent of Total Trees	CO_2 Sequestered Annually		CO_2 Stored	
			Metric Ton/Tree	Total Metric Tons	Metric Tons/Tree	Total Metric Tons
11	15,184	52%	0.11	1,615.58	0.87	13,241.97
23	12,930	44%	0.27	3,504.03	4.83	62,437.68
25	1,186	4%	0.30	355.44	5.84	6,927.66
Totals	**29,300**	**100%**		**5,475.05**		**82,607.31**

Notes:
1. *Trees counts based on the high estimated provided in the Forest management Plan prepared by Staub Forestry & Environmental consulting dated September 2006.*
2. *Modeling assumptions used included all trees be Coast live oaks.*

Source: USDA 2010b, Staub 2006.

CURRENT GREENHOUSE GAS EMISSIONS

California Emissions

The California Energy Commission estimates that California is the second-largest state emitter of GHG emissions in the United States, behind Texas in absolute emissions (CEC 2006). However, the state has relatively low carbon intensity when considering GHG emissions per person or GHG emissions per unit gross state product. Worldwide, California is responsible for approximately 2 percent of the world's CO_2 emissions (CEC 2006). The California Air Resources Board (CARB) released estimates of California's 1990 emissions inventory, which amounted to 433.29 million gross metric tons of carbon dioxide equivalent (MMT CO_2e) (CARB 2009). CARB has also estimated that 2008 emissions levels were 477 MMT CO_2e (CARB 2010).

Monterey County Emissions

According to the Monterey County General Plan Draft Environmental Impact Report (Monterey County 2008), in 2006 1,394,404 metric tons of CO_2e was emitted Countywide. While many different sources emit GHG emissions in Monterey County, a few sources account for the vast majority of emissions. The on-road transportation category—comprising cars and trucks—is by far the largest contributor of GHG emissions in the region, accounting for 46 percent of the total, almost three times as much as the next largest sector. Electricity generation and industrial processes were the second (15 percent) and third (14 percent) highest emitting sectors. These top three categories emit 75 percent of total GHG emissions in Monterey County. Natural gas combustion is the fourth highest emitting category (13.6 percent). Finally, agricultural equipment fuel use and landfill emissions account for 8 and 2 percent of the emissions, respectively (Monterey County 2008).

3.13.2 REGULATORY SETTING

FEDERAL

Federal Regulation and the Clean Air Act

In the past, the U.S. Environmental Protection Agency (USEPA) has not regulated GHGs under the Clean Air Act (CAA) because it asserted that the act did not authorize the USEPA to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. However, the U.S. Supreme Court held that the USEPA must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, 12 states and cities, including California, together with several environmental organizations, sued to require the USEPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 [2007]). The court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and that the USEPA did not have a valid rationale for not regulating GHGs. In response to this ruling, the USEPA has recently made

an endangerment finding that GHGs pose a threat to the public health and welfare. This is the first step necessary for the establishment of federal GHG regulations under the Clean Air Act.

In April 2010, the USEPA issued the final rule on new standards for GHG emissions and fuel economy for light-duty vehicles in model years 2017–2025. In November 2010, the USEPA published the "Prevention of Significant Deterioration (PSD) and Title V Permitting Guidance for Greenhouse Gases," which provides the basic information that permit writers and applicants need to address GHG emissions regulated under the Clean Air Act. In that document, the USEPA described the "Tailoring Rule" in the regulation of GHG emissions. With the Tailoring Rule, the USEPA established a phased schedule in the regulation of stationary sources. The first phase of the Tailoring Rule began January 2, 2011, and focuses the GHG permitting programs on the largest sources with the most Clean Air Act-permitting experience. In phase two, which began June 1, 2011, the rule expands to cover large sources of GHGs that may not have been previously covered by the Clean Air Act for other pollutants. The rule also describes the USEPA's commitment to future rulemaking that will describe subsequent steps of the Tailoring Rule for GHG permitting (USEPA 2010d).

Federal Heavy-Duty National Program

In August 2011, the USEPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced the first-ever program to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses. The USEPA and the NHTSA have each adopted complementary standards under their respective authorities covering model years 2014–2018, which together form a comprehensive Heavy-Duty National Program. The goal of the joint rulemakings is to present coordinated federal standards that help manufacturers build a single fleet of vehicles and engines that are able to comply with both agencies. The USEPA and NHTSA have adopted standards for CO_2 emissions and fuel consumption, respectively, tailored to each of three main regulatory categories: (1) combination tractors; (2) heavy-duty pickup trucks and vans; and (3) vocational vehicles. The USEPA has additionally adopted standards to control HFC leakage from air conditioning systems in pickups and vans and combination tractors. Also exclusive to the USEPA program are the USEPA's N_2O and CH_4 standards that will apply to all heavy-duty engines, pickups, and vans. For purposes of this program, the heavy-duty fleet incorporates all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds, and the engines that power them, except those covered by the current GHG emissions and Corporate Average Fuel Economy standards for model year 2012–2016 passenger vehicles.

The Heavy-Duty National Program is projected to reduce fuel use and GHG emissions from medium- and heavy-duty vehicles, from semi-trucks to the largest pickup trucks and vans, as well as all types and sizes of work trucks and buses in between. Vehicles covered by this program make up the transportation segment's second largest contributor to oil consumption and GHG emissions. This comprehensive program is designed to address the urgent and closely intertwined challenges of dependence on oil, energy security, and global climate change. The USEPA and the NHTSA estimate that the combined standards

will reduce CO_2 emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of vehicles built for the 2014 to 2018 model years, providing $49 billion in net program benefits. A second phase of regulations is planned for model years beyond 2018. The goals would include spurring innovation as well as updating the assessment of actual emissions and fuel use from this sector. Such future regulation would also be designed to align with similar programs developed outside the U.S.

STATE

Assembly Bill 1493

Assembly Bill (AB) 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the California Air Resources Board (CARB) to develop and adopt the nation's first GHG emission standards, also known as Pavley 1, for automobiles. The California legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the state of California submitted a request for a waiver from federal clean air regulations, as the state is authorized to do under the CAA, to allow the state to require reduced tailpipe emissions of CO_2. In late 2007, the USEPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the state brought suit against the USEPA related to this denial.

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

Also in 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the U.S. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon (mpg) by 2016. When the national program takes effect, California has committed to allowing automakers showing compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards requiring a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order S-3-05

Executive Order S-3-05 (State of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multiagency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the secretary of CalEPA created a Climate Action Team made up of members from various state agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic reports on progress. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases regulated by AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, nitrogen trifluoride, and SF_6. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions phased in scheduled to start in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. CARB is implementing this program. The CARB board adopted a draft resolution for formal cap-and-trade rulemaking on December 16, 2010, and is developing offset protocols and compliance requirements. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Climate Change Scoping Plan

In October 2008, CARB published its Climate Change Proposed Scoping Plan, which is the state's plan to achieve GHG reductions in California as required by AB 32. The scoping plan contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of CO_2e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002–2004 average emissions). The scoping plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations are from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO_2e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and a renewable portfolio standard for electricity production (21.3 MMT CO_2e). The scoping plan identifies the local equivalent of AB 32 targets as a 15 percent reduction below baseline GHG emissions level, with baseline interpreted as GHG emissions levels between 2003 and 2008. The scoping plan states that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. (Meanwhile, CARB is also developing an additional protocol for community emissions.) CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions resulting from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The scoping plan states that the ultimate GHG reduction assignment to local government operations is to be determined. With regard to land use planning, the scoping plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of Senate Bill (SB) 375, discussed further below. The Climate Change Scoping Plan was approved by CARB on December 11, 2008.

The status of the scoping plan had been uncertain as a result of a court decision in the case of *Association of Irritated Residents v. California Air Resources Board* (San Francisco Superior Court Case No. CPF-09-509562). The court found that CARB, in its CEQA review, had not adequately explained why it selected a scoping plan that included a cap-and-trade program rather than an alternative plan. While CARB disagreed with the trial court finding and has appealed the decision, in order to remove any doubt about the matter and in keeping with CARB's interest in public participation and informed decision making, CARB revisited the alternatives. The revised analysis includes the five alternatives included in the original environmental analysis: a "no project" alternative (that is, taking no action at all); a plan relying on a cap-and-trade program for the sectors included in a cap; a plan relying more on source-specific regulatory requirements with no cap-and-trade component; a plan relying on a carbon fee or tax; and a plan relying on a variety of proposed strategies and measures. The revised analysis relies on emissions projections updated in light of current economic forecasts, accounting for the economic downturn since 2008 and reduction measures already approved and put in place.

The public hearing to consider approval of the AB 32 Scoping Plan Functional Equivalent Document (including the Supplement) and the AB 32 Scoping Plan was held on August 24, 2011. On this date, the Scoping Plan was re-approved by CARB.

Senate Bill 1368

SB 1368 (codified at Public Utilities Code Chapter 3) is the companion bill of AB 32. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The bill also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural-gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

Senate Bill 1078, Governor's Order S-14-08, and Senate Bill 2X (California Renewables Portfolio Standards)

SB 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. This SB will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewable Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target.

Prior to the Executive Order, the California Public Utilities Commission and the California Energy Commission were responsible for implementing and overseeing the Renewables Portfolio Standards. The Executive Order shifted that responsibility to the CARB, requiring them to adopt regulations by July 31, 2010. CARB is required by current law, AB 32 of 2006, to regulate sources of GHGs to meet a state goal of reducing GHG emissions to 1990 levels by 2020 and an 80 percent reduction of 1990 levels by 2050.

In March 2011, SB 2X established S-14-08 as law passed the state's legislature. While SB 2X contains the same targets as Governor's Order S-14-08 (33 percent of their supply from renewable sources by 2020), as an executive order it did not have the force of law (Governor's Order can be reversed by future governors).

Senate Bill 375

SB 375 (codified at Government Code and Public Resources Code[1]), signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a Sustainable Communities Strategy or Alternative Planning Strategy, which will prescribe land use allocation in that MPO's Regional Transportation Plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's Sustainable Communities Strategy or Alternative Planning Strategy for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

California Building Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was 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. On January 1, 2010, the California Building Standards Commission adopted CALGreen and became the first state in the United States to adopt a statewide green building standards code. CALGreen requires new buildings to reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low pollutant-emitting materials.

LOCAL

Monterey Bay Unified Air Pollution Control District

To provide guidance to local lead agencies on determining significance for GHG emissions in CEQA documents, the Monterey Bay Union Air Pollution Control District (MBUAPCD) staff proposed interim GHG CEQA Significance Thresholds in June 2011. These thresholds have not been finalized and continue to be developed. Therefore, MBUAPCD has no established significance thresholds for greenhouse gas emissions.

[1] Senate Bill 375 is codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588, 14522.1, 14522.2, and 65080.01 as well as Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2.

Monterey County General Plan

Policies

20.2.3 The County shall continue to support air quality monitoring and air pollution control strategies and enforcement by the Monterey Bay Unified Air Pollution Control District.

20.2.4 The County should operate in accordance with current regional, state, and federal air quality standards.

20.2.5 The County shall encourage the use of the best available control technology as defined in the most current Monterey Bay Unified Air Pollution Control District rules and regulations in reducing air pollution emissions.

3.13.3 PROJECT IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Criteria for determining the significance of air quality impacts were developed based on information contained in the California Environmental Quality Act Guidelines (CEQA Guidelines, Appendix G). According to those guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

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

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

To meet GHG emission targets of AB 32, described above, California would need to generate fewer GHG emissions in the future than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels or conflict with the goals of AB 32. Moreover, emitting GHG emissions into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of GHG emissions in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of GHGs into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of GHGs emitted as a result of the proposed project would result in any altered conditions.

However, the state of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California that should be addressed under CEQA. Although AB 32 did not amend CEQA, it identifies the myriad environmental problems in California caused by global warming (Health and Safety Code, Section 38501[a]). In response to the relative lack of guidance on addressing GHGs and climate change, SB 97 was passed in order to amend CEQA by directing the Office of Planning and Research (OPR) to prepare revisions to the CEQA Guidelines addressing the mitigation of GHGs or their consequences. These revisions to the CEQA Guidelines went into effect in January 2010.

Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures. Currently, neither the neither the CEQA statutes, the Office of Planning and Research (OPR) guidelines, nor the State CEQA Guidelines prescribe specific quantitative thresholds of significance or a particular methodology for performing an impact analysis. Significance criteria are left to the judgment and discretion of the Lead Agency, in this case the County of Monterey.

Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects be disclosed and mitigated to the extent feasible whenever the Lead Agency determines that a project contributes to a significant cumulative climate change impact. In June 2008, OPR issued a Technical Advisory titled "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review." The recommended approach for GHG analysis included in the Governor's OPR June 2008 Technical Advisory (TA) is to: (1) identify and quantify GHG emissions, (2) assess the significance of the impact on global climate change, and (3) if significant, identify alternatives and/or mitigation measures to reduce the impact below significance.

This EIR identifies and quantifies the GHG emissions of the proposed project. Moreover, it assesses the project's potential to result in a significant GHG impact by determining its consistency with strategies identified in the AB 32 Scoping Plan for reducing GHG emissions. As stated previously, the AB 32 Scoping Plan contains the main strategies California is implementing to achieve reduction of 169 MMT of CO_2e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario. The AB 32 Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. Monterey County's threshold of significance qualitatively considers whether a proposed project would conflict with the relevant AB 32 Scoping Plan strategies. If a project conflicts with the relevant AB 32 Scoping Plan strategies, the impact would be considered to be cumulatively considerable (i.e., significant), and mitigation measures would be required to make the proposed project compliant with those strategies.

Methodology

Methodologies employed for the analysis of short-term and long-term air quality impacts associated with the proposed project are discussed in more detail, as follows:

Estimated GHGs attributable to the proposed project, with the exception emissions associated with water/wastewater and solid waste generation, were calculated by Ambient (Ambient 2009) using the URBEMIS2007 computer program and emission factors obtained from existing environmental documentation. Emissions of CO_2 associated with mobile and area sources were obtained from the URBEMIS2007 computer program. Mobile-source emissions of N_20 and CH_4 were calculated based on estimated vehicle miles traveled obtained from the URBEMIS computer program and emission factors obtained from the *California Climate Action Registry General Reporting Protocol* (2009). Emissions of N_20 and CH_4 associated with electricity and natural gas use were calculated based on emission factors obtained from the *California Climate Action Registry General Reporting Protocol* (2009) and usage rates obtained from the California Energy Commission. Emissions were converted to CO_2 equivalent units of measure, expressed in annual metric tons (i.e., MT CO_2e), based on the global warming potential of the individual pollutants. Emissions associated with water conveyance, wastewater treatment, and solid waste generation has been calculated using the California Emissions Estimator Model (CalEEMod), version 2011.1.1, computer program. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for the use of government agencies, land use planners, and environmental professionals.

PROJECT IMPACTS AND MITIGATION MEASURES

Increase of Greenhouse Gas Emissions

Impact 3.13-1 Development of the proposed project would contribute to increases of GHG emissions that are associated with global climate change. Therefore, the proposed project would result in increased greenhouse gas emissions that would be considered a **potentially cumulatively considerable** impact.

Development of the proposed project would contribute to short-term and long-term increases of GHG emissions that are associated with global climate change. Temporary increases in GHG emissions would be associated with construction activities including but are not limited to, grading, clearing, construction, tree removal and disposal. Operational emissions would be primarily associated with mobile source emissions. In addition, changes to natural resources on the project site that currently store and sequester carbon would result in changes to the carbon cycle and may result in the release of CO_2.

GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contributes substantially to the

phenomenon of global climate change and its associated environmental impacts and as such is addressed only as a cumulative impact.

Construction Emissions

Temporary emissions would be associated with the use of gasoline or diesel powered equipment to remove the trees and release of carbon through disposal of removed trees and disturbance of soils during site clearing, grading and construction. Short-term construction equipment emissions associated with the development of the proposed land uses are summarized in **Table 3.13-5**.

TABLE 3.13-5
SHORT-TERM CONSTRUCTION EQUIPMENT GREENHOUSE GAS EMISSIONS

Construction Year	CO_2 Equivalent (MT/Year)
Year One	144
Year Two	418
Year Three	289
Year Four	276
Year Five	208

*Notes: CO_2 emissions were calculated by Ambient (Ambient 2009) using the URBEMIS2007 computer program based on default equipment usage requirements and emission factors contained in the model and proposed project phasing. CO_2 emissions were converted from tons to metric tons, and N_2O and CH_4 emissions resulting from project construction were extrapolated from projected CO_2 emissions and determined using the California Climate Action Registry General Reporting Protocol Version 3.1 (January 2009). See **Appendix B** for data inputs.*

As shown in **Table 3.13-5**, the project would generate a maximum of approximately 418 metric tons per year of CO_2e from construction equipment emissions, with an average of 267 metric tons.

Implementation of mitigation measure **MM 3.2-1** (see Section 3.2, Air Quality) requires implementation of Best-Available Control Measures (BACM) during site preparation and construction, and a construction emissions reduction plan (CERP) that includes measures recommend by MBUAPCD. This mitigation measure would substantially reduce GHG emissions during construction as it includes the stipulation that all on- and off-road diesel equipment will not idle for more than 5 minutes, except as needed to perform a specified function (e.g., concrete mixing) and that diesel equipment used onsite would for the most part be year 2003 models, or newer. Diesel equipment older than 2003 would be required to be retrofitted with emission control technology (e.g., diesel-particulate filter); or, use alternative fuels (e.g., biodiesel). For equipment retrofitted to operate with diesel-exhaust emissions control technology, mitigation measure **MM 3.2-1** mandates the inclusion of a verification of installation or presence of these devices for review by MBUAPCD.

Operational Emissions

Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 from mobile sources. To a lesser extent, other GHG pollutants, such as methane and nitrous oxide would also be generated, largely associated

with electricity use and natural-gas consumption. Estimated emissions of CO_2 were calculated using the URBEMIS2007 computer program, based on default parameters (i.e., emission factors, vehicle fleet, and trip distribution data) contained in the model and vehicle data obtained from the traffic analysis prepared for this project. Emissions were converted to CO_2 equivalents (i.e., CO_2e), expressed in metric tons (MT). Emissions associated with water conveyance, wastewater treatment, and solid waste generation has been calculated using the California Emissions Estimator Model (CalEEMod), version 2011.1.1, computer program. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for the use of government agencies, land use planners, and environmental professionals. Long-term operational emissions associated with the development of the proposed land uses are summarized in **Table 3.13-6**.

TABLE 3.13-6
LONG-TERM GREENHOUSE GAS EMISSIONS

EMISSIONS SOURCE	CO_2 EQUIVALENT (MT/YEAR)[1]
Motor Vehicles	3,370.5
Electricity Use	812.4
Natural Gas Use	781.3
Hearth Use	172.7
Landscape Maintenance	1.9
Solid Waste	167.8
Water/Wastewater	103.6
Total:	5,410.2

Notes: Emissions were calculated using the URBEMIS2007 computer program, as well as electricity and natural gas usage rates obtained from the California Energy Commission for PG&E forecast zone 4, within which the project site is located. Emissions associated with electricity and natural gas use were based on emission factors derived from the California Climate Action Registry's General Reporting Protocol (2009). Emissions were converted to CO_2 equivalents (i.e., CO_2e), expressed in annual metric tons. Emissions associated with water conveyance, wastewater treatment, and solid waste generation has been calculated by PMC using CalEEMod. Refer to Appendix B for modeling assumptions and results.

Source: Ambient 2009; PMC

As shown in **Table 3.13-6**, the proposed project would generate a maximum of approximately 5,410 MT/year of CO_2e upon buildout. Approximately 63 percent of the predicted annual operational GHG emissions would be associated with motor vehicle use.

CO_2 Storage and Sequestration

Implementation of the proposed project would result in the removal of approximately 921 trees and disturbance of approximately 92 acres of soil. Removal of trees/oak woodlands, replanting of trees, and disturbance of soil, can affect the amount of CO_2 sequestered on the project site and result in the release stored CO_2. In addition, proposed tree removal using gasoline powered equipment used to remove the trees would generate additional CO_2 emissions through the burning of fossil fuels.

As noted above, it is estimated that approximately 92,351 metric tons of CO_2 is currently stored on the project site within the trees and soil (tree equal approximately 82,607 metric tons; and the soil equals approximately 9,744 metric tons). Using the CUFR Tree Carbon

Calculator, it has been estimated that the amount of stored CO_2 that would be released through removal of 921 trees would be approximately 2,590 metric tons, of which approximately 1,101 metric tons would be stored in above-ground biomass. The disposal of removed trees through burning or natural decay would release stored carbon but at different rates and in different forms. Wood that is burned immediately returns carbon in the form of combustion gasses, primarily CO_2 and methane. Wood that naturally decays would return carbon over many years. In addition, disturbance of approximately 92 acres of soil would release approximately 1,067 metric tons of carbon into the atmosphere (11.2 metric tons of carbon per acre x 92 acres).

The removal of approximately 921 trees would initially (prior to replanting) reduce the rate of carbon sequestration on the project site by approximately 172 metric tons per year as shown in **Table 3.13-7**. However, all oak trees must be replaced by replanting trees from native seed stock at a ratio of 1:1 (see mitigation measure **MM 3.3-6a**). It would take approximately 25 years for the replanted trees to sequester CO_2 at the same rate as the removed trees and over 30 years to store the same amount of CO_2 within the trees as currently stored, as shown in **Table 3.13-8**.

TABLE 3.13-7
ESTIMATED REDUCTION IN CO_2 SEQUESTRATION DUE TO TREE REMOVAL

DBH (Inches)	Total # of Trees to be Removed	% of Total Trees	Reduction in CO_2 Sequestration	
			Metric Ton/Tree/Year	Total Metric Tons/Year
11	479	52%	0.11	50.96
23	405	44%	0.27	109.82
25	37	4%	0.30	11.04
Totals	**921**	**100%**		**171.82**

Notes:
1. *Total tree count based on the high estimated provided in the Forest management Plan prepared by Staub Forestry & Environmental consulting dated September 2006. Number of trees by size estimated based on the percentage of total number of tree that size on the project site.*
2. *Modeling assumptions used included all trees be Coast live oaks.*

Source: USDA 2010b, Staub 2006.

TABLE 3.13-8
CO_2 SEQUESTRATION AND STORAGE UPON REPLANTING OF TREES

Years After Planting	CO_2 Sequestered Annually		CO_2 Stored	
	Metric Ton/Tree	Total Metric Tons	Metric Ton/Tree	Total Metric Tons
5	0.02	17.87	0.05	45.87
10	0.05	46.42	0.24	218.65
15	0.09	78.84	0.59	546.89
20	0.12	113.56	1.13	1,044.41
25	0.16	149.57	1.87	1,719.69
30	0.20	186.41	2.80	2,577.79

Notes:
1. *Replanting of trees at a ratio of 1:1 (921 trees)*
2. *Modeling assumptions used included all trees be Coast live oaks.*

Source: USDA 2010b

Implementation of the mitigation measures **MM 3.3-6a, MM 3.3-6b** (see Section 3.3, Biological Resources) and **MM 3.5-1** (see Section 3.5, Geology and Soils) would minimize removal of and/or damage to existing trees and soil disturbance. Mitigation measure **MM 3.3-6a** requires preparation of site specific tree removal and replacement plans prior to issuance of grading permit to ensure the loss of oak woodlands and individual coast live oak trees (*Quercus agrifolia*) is minimized and that removed trees are replanted in accordance with Section 21.64.260 of the *Monterey County Zoning Ordinance* and Section 21083.4 of the CEQA Guidelines. Mitigation measure **MM 3.3-6b** requires installation of protective fencing along the driplines of protected trees in order to minimize damage to remaining trees during construction. Mitigation measure **MM 3.5-1** would ensure that design level specifications and recommendations provided in the Geotechnical Investigation prepared by Soil Survey, Inc. in the December 31, 2007 or any subsequent updates are followed for individual lots. Implementation of these measures would minimize the proposed project's impact on the carbon stored and sequestered on the project site.

AB 32 Compliance

As stated above, for the purposes of evaluating the proposed project's GHG impacts, and in the absence of locally adopted Air District emission standards, the project is be considered to have a significant impact if it would be in conflict with the AB 32 goals for reducing greenhouse gas emissions. In August 2011, CARB approved the AB 32 Scoping Plan outlining the state's strategy to achieve the 2020 GHG emissions limit. This Scoping Plan, developed by CARB in coordination with the Climate Action Team (CAT), proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. The measures in the Scoping Plan are scheduled to be in place in 2012. The Scoping Plan contains a list of 39 recommended actions contained in Appendices C and E of the Scoping Plan. This list is also shown in **Table 3.13-9**.

TABLE 3.13-9
RECOMMENDED ACTIONS OF CLIMATE CHANGE SCOPING PLAN

Measure Number	Measure Description
Transportation	
T-1	Pavley I and II – Light Duty Vehicle Greenhouse Gas Standards
T-2	Low Carbon Fuel Standard (Discrete Early Action)
T-3	Regional Transportation-Related Greenhouse Gas Targets
T-4	Vehicle Efficiency Measures
T-5	Ship Electrification at Ports (Discrete Early Action)
T-6	Goods Movement Efficiency Measures • Ship Electrification at Ports • System-Wide Efficiency Improvements
T-7	Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure – Aerodynamic

Measure Number	Measure Description
	Efficiency (Discrete Early Action)
T-8	Medium- and Heavy-Duty Vehicle Hybridization
T-9	High Speed Rail
Electricity and Natural Gas	
E-1	Energy Efficiency (32,000 GWh of Reduced Demand) • Increased Utility Energy Efficiency Programs • More Stringent Building & Appliance Standards Additional Efficiency and Conservation Programs
E-2	Increase Combined Heat and Power Use by 30,000 GWh (Net reductions include avoided transmission line loss)
E-3	Renewables Portfolio Standard (33% by 2020)
E-4	Million Solar Roofs (including California Solar Initiative, New Solar Homes Partnership and solar programs of publicly owned utilities) • Target of 3000 MW Total Installation by 2020
CR-1	Energy Efficiency (800 Million Therms Reduced Consumptions) • Utility Energy Efficiency Programs • Building and Appliance Standards • Additional Efficiency and Conservation Programs
CR-2	Solar Water Heating (AB 1470 goal)
Green Buildings	
GB-1	Green Buildings
Water	
W-1	Water Use Efficiency
W-2	Water Recycling
W-3	Water System Energy Efficiency
W-4	Reuse Urban Runoff
W-5	Increase Renewable Energy Production
W-6	Public Goods Charge (Water)
Industry	
I-1	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources
I-2	Oil and Gas Extraction GHG Emission Reduction
I-3	GHG Leak Reduction from Oil and Gas Transmission
I-4	Refinery Flare Recovery Process Improvements
I-5	Removal of Methane Exemption from Existing Refinery Regulations

Measure Number	Measure Description
Recycling and Waste Management	
RW-1	Landfill Methane Control (Discrete Early Action)
RW-2	Additional Reductions in Landfill Methane • Increase the Efficiency of Landfill Methane Capture
RW-3	High Recycling/Zero Waste • Commercial Recycling • Increase Production and Markets for Compost • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing
Forests	
F-1	Sustainable Forest Target
High Global Warming Potential (GWP) Gases	
H-1	Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Services (Discrete Early Action)
H-2	SF_6 Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)
H-3	Reduction of Perfuorocarbons in Semiconductor Manufacturing (Discrete Early Action)
H-4	Limit High GWP Use in Consumer Products Discrete Early Action (Adopted June 2008)
H-5	High GWP Reductions from Mobile Sources • Low GWP Refrigerants for New Motor Vehicle Air Conditioning Systems • Air Conditioner Refrigerant Leak Test During Vehicle Smog Check • Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers • Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems
H-6	High GWP Reductions from Stationary Sources • High GWP Stationary Equipment Refrigerant Management Program: – Refrigerant Tracking/Reporting/Repair Deposit Program – Specifications for Commercial and Industrial Refrigeration Systems • Foam Recovery and Destruction Program • SF Leak Reduction and Recycling in Electrical Applications • Alternative Suppressants in Fire Protection Systems • Residential Refrigeration Early Retirement Program
H-7	Mitigation Fee on High GWP Gases
Agriculture	
A-1	Methane Capture at Large Dairies

The strategies included in the Scoping Plan that apply to the project are contained in **Table 3.13-10**, which also summarizes the extent to which the project would comply with the strategies to help California reach the emission reduction targets. The strategies listed in **Table 3.13-10** are either required mitigation measures or requirements under local or state ordinances. With implementation of these strategies/measures, the project's contribution to cumulative GHG emissions would be reduced. In order to ensure that the proposed project complies with and would not conflict with or impede the implementation of reduction goals identified in AB 32, mitigation measure **MM 3.13-1**, described below, shall be implemented.

TABLE 3.13-10
AB 32 COMPLIANCE

Strategy	Project Compliance
Energy Efficiency Measures	
Energy Efficiency Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities). **Renewable Portfolio Standard** Achieve a 33 percent renewable energy mix statewide. **Green Building Strategy** Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.	**Compliant** The proposed project will comply with the updated Title 24 standards, including the new 2010 California Building Code (CBC), for building construction. These standards require new buildings to reduce water consumption by 20 percent, which results in less energy consumption for pumping water. In addition, the project would comply with mitigation measure **MM 3.13.1**, identified below, including measures to incorporate energy-efficient building design features.
Water Conservation and Efficiency Measures	
Water Use Efficiency Continue efficiency programs and use cleaner energy sources to move and treat water. Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions.	**Compliant** As previously describes, the project would comply with Title 24 standards which require new buildings to reduce water consumption by 20 percent. In addition, the project would comply with mitigation measure **MM 3.13.1**, identified below, including measures to increase water use efficiency, such as the installation of high-efficiency urinals that use only 1/8 gallon (one pint) of water per flush. This fixture reduces water use by 87 percent compared to the conventional one gallon per flush urinal. The 1/8-gallon urinal also requires less maintenance than waterless urinals. All restroom toilets will also be highly efficient and reduce water use.

Strategy	Project Compliance
Transportation and Motor Vehicle Measures	
Vehicle Climate Change Standards AB 1493 (Pavley) required the State to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles and light-duty trucks. Regulations were adopted by CARB in September 2004. **Light-Duty Vehicle Efficiency Measures** Implement additional measures that could reduce light-duty GHG emissions. For example, measures to ensure that tires are properly inflated can both reduce GHG emissions and improve fuel efficiency. **Adopt Heavy- and Medium-Duty Fuel and Engine Efficiency Measures** Regulations to require retrofits to improve the fuel efficiency of heavy-duty trucks that could include devices that reduce aerodynamic drag and rolling resistance. This measure could also include hybridization of and increased engine efficiency of vehicles. **Low Carbon Fuel Standard** CARB identified this measure as a Discrete Early Action Measure. This measure would reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.	**Compliant** The project does not involve the manufacture of vehicles. However, vehicles that are purchased and used within the project site would comply with any vehicle and fuel standards that CARB adopts.
Regional Transportation-Related Greenhouse Gas Targets Develop regional GHG emissions reduction targets for passenger vehicles. Local governments will play a significant role in the regional planning process to reach passenger vehicle GHG emissions reduction targets. Local governments have the ability to directly influence both the siting and design of new residential and commercial developments in a way that reduces GHGs associated with vehicle travel.	**Compliant** Specific regional emission targets for transportation emissions do not directly apply to this project; regional GHG reduction target development is outside the scope of this project. The project will comply with any plans developed by Monterey County.
Measures to Reduce High Global Warming Potential (GWP) Gases CARB has identified Discrete Early Action measures to reduce GHG emissions from the refrigerants used in car air conditioners, semiconductor manufacturing, and consumer products. CARB has also identified potential reduction opportunities for future commercial and industrial refrigeration, changing the refrigerants used in auto air conditioning systems, and ensuring that existing car air conditioning systems do not leak.	**Compliant** New products used or serviced on the project site (after implementation of the reduction of GHG gases) would comply with future CARB rules and regulations.

Strategy	Project Compliance
Forests	
Urban Forestry A statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	**Compliant** Mitigation measure **MM 3.3-6a** requires preparation of site specific tree removal and replacement plans prior to issuance of grading permit to ensure the loss of oak woodlands and individual coast live oak trees (*Quercus agrifolia*) is minimized and that removed trees are replanted in accordance with Section 21.64.260 of the *Monterey County Zoning Ordinance* and Section 21083.4 of the CEQA Guidelines. Mitigation measure **MM 3.3-6b** requires installation of protective fencing along the driplines of protected trees in order to minimize damage to remaining trees during construction.
Recycling and Waste Management	
High Recycling / Zero Waste Achieve 50 percent statewide Recycling Goal: Achieving the state's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	**Compliant** Mitigation measure **MM 3.13-1** requires the reuse and recycling of construction and demolition waste to the maximum extent practical. In addition, the Monterey Regional Waste Management District which would serve the proposed project is compliant with the Assembly Bill 939 State-mandated 50 percent recycling goal.

In order to ensure that the proposed project complies with and would not conflict with or impede the implementation of reduction goals identified in AB 32, mitigation measure **MM 3.13-1** shall be implemented.

Mitigation Measure

MM 3.13-1 Prior to building permit approval, Monterey County Planning Department shall require that project applicant(s) implement the following measures to reduce short-term and long-term emissions of GHGs associated with construction and operation of the proposed project:

Construction

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard) to the extent practical.
- Low- or No-VOC paints, adhesives and sealants shall be used during the construction of all proposed onsite structures.
- Environmentally preferable and low-emitting materials shall be used for interior finishes and flooring materials of proposed onsite structures.

Operation

- Bicycle parking facilities and preferential parking for carpooling and alternative-fueled vehicles shall be provided at locations (such as the winery facility) determined by the County of Monterey Planning Director. This measure encourages use of alternative transportation by employees and helps to reduce the amount vehicle miles traveled by the project.
- Proposed commercial uses shall provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas.
- Commercial buildings shall employ energy-efficient technology unless technical feasibility of safety concerns take precedent. Examples of such systems would include use of T5HO fluorescent fixtures with electronic ballast, occupancy sensor lighting controls, light emitting diodes, external lighting controls and timers, and other similar measures.
- Indoor water conservation measures shall be incorporated, such as use of low-flow toilets, shower heads, and faucets.
- Wood-burning fireplaces and stoves shall be prohibited.
- Proposed residential land uses shall provide a minimum of one exterior electrical outlet at rear, side, and front yard locations to promote/allow the use of electric landscape maintenance equipment.
- Proposed residential land uses shall be designed to meet Title 24 California Green Building Standards Code (CALGreen) as adopted by Monterey County. Effective measures that can be incorporated into building designs to help reduce energy consumption include, but are not necessarily limited to, the following:
    - Increased building insulation.
    - Use of Low-E windows and doors and Energy-Star rated roofing materials.
    - Installation of energy-efficient lighting and lighting control systems.
    - Installation of energy-efficient (e.g., Energy-Star rated) heating and cooling systems, appliances and equipment.
    - Installation of light colored "cool" roofs (i.e., high reflectance, high emittance roof surfaces) on non-residential structures.
    - Use of daylight as an integral part of lighting systems in buildings.

In addition to the above mitigation measure, the proposed project will be conditioned to comply with Section 18.44.040 of the Monterey County Municipal Codes, which requires that all new construction use low water use or native plant material and low precipitation sprinkler heads, bubblers, drip irrigation system and timing devices for all exterior landscaping. Before any permit may be issued for such new construction, the applicant shall submit a landscape plan for review and approval by the Director of Building Inspection in conformity with landscape guidelines adopted by the Board of Supervisors. Such measures would result in the demand for less water consumption which then results in less energy consumption for pumping water.

The proposed project would also be conditioned to comply with Section 19.10.080 of the Monterey County Municipal Code. Section 19.10.080, Energy Conservation, requires the design of a subdivision to provide, to the extent feasible, for future passive or natural heating or cooling opportunities in the subdivision. Examples of passive or natural heating opportunities in subdivision design include design of lot size and configuration to permit orientation of a structure in east-west alignment for southern exposure. Examples of passive or natural cooling opportunities in subdivision design include design of lot size and configuration to permit orientation of a structure to take advantage of shade or prevailing breezes. In providing for future passive or natural heating and cooling opportunities in the design of the proposed residential development, consideration shall be given to local climate, to contour, to configuration of the parcels, and to other design improvement requirements.

Implementation of mitigation measure **MM 3.13-1** as well as compliance with Section 18.44.050 and 19.10.080 of the Monterey County Municipal Code and application of State regulatory requirements such as the Renewables Portfolio Standards, CALGreen Building Energy Efficiency Standards, and Pavley regulations described above, would reduce project-generated GHG emissions and would ensure consistency with GHG emission-reduction strategies adopted by the State of California. Furthermore, implementation of mitigation measure **MM 3.2-1** (see Section 3.2, Air Quality) would substantially reduce GHG emissions during construction and implementation of the mitigation measures **MM 3.3-6a, MM 3.3-6b** (see Section 3.3, Biological Resources) and **MM 3.5-1** (see Section 3.5, Geology and Soils) would minimize the proposed project's impact on the carbon stored and sequestered on the project site.

For these reasons, the project as mitigated would result in GHG emissions below those projected in **Table 3.13-6.** While not all of the GHG reduction realized by the mitigation measures above are quantifiable due to emissions modeling software limitations, **Table 3.13-10** presents GHG emissions reductions from all the quantifiable mitigation measures and conditions required**.** Reductions in GHG emissions were quantified using CalEEMod. The CalEEMod-attributed percent reductions associated with the quantifiable mitigation measures and conditions were applied to the projected GHG emissions depicted in **Table 3.13-6**.

As shown in **Table 3.13-11**, the quantifiable requirements of mitigation measure **MM 3.13.1** and the Monterey Municipal Code would reduce GHG emissions by an estimated 152 metric tons of CO_2e each year of project operations.

TABLE 3.13-11
ESTIMATED GREENHOUSE GAS EMISSION REDUCTIONS – (METRIC TONS PER YEAR)

Emissions Source	Percent Reduction	CO_2 Equivalent Reductions (MT/Year)	Mitigated GHG (MT/Year)
Motor Vehicles	0.1%	3.3	3,367.2
Energy Use (Electricity and Natural Gas)	7.1%	113	1,480.7
Area/Hearth Use	10.2%	17.6	155.1
Landscape Maintenance	0%	0	1.9
Solid Waste	0%	0	167.8
Water/Wastewater	17.2%	17.8	85.8
Total:	**3.3%**	**151.7**	**5,258.5**

Notes: Emission reductions percentages quantified with CalEEMod version 2011.1.1. See Appendix B for data inputs.

In summary, while it is difficult to quantify the exact reductions in GHG emissions anticipated from the project mitigation measures and existing code requirements, the modeling and reduction estimates demonstrate that the proposed project would be consistent with the goals of California's AB 32. By incorporating energy efficient construction methods and project features such as fixtures and infrastructure that use less energy and water, the proposed project would result in lower GHG emission rates compared to the "business as usual" Scenario. Since the project is consistent with relevant AB 32 Scoping Plan strategies, and there are no locally adopted GHG emissions thresholds, the project's contribution to the impact of global climate change is considered **less than significant** at the project-specific and cumulative level.

References/Documentation

Ambient Air Quality and Noise Consultants. (Ambient) 2009. *Air Quality Impact Assessment for Ferrini Ranch Subdivision*. February 6, 2009.

California Air Resources Board (CARB). 2010. *California Greenhouse Gas Inventory for 2000–2008*. http://www.arb.ca.gov/cc/inventory/data/data.htm

2009. *California Greenhouse Gas Inventory Data 2000 to 2006*. Last Reviewed on December 10, 2009.

California Climate Action Registry. 2009. *California Climate Action Registry General Reporting Protocol Version 3.1*.

California Energy Commission (CEC).2006. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Publication CEC-600-2006-013-D.

California Natural Resources Agency (CNRA). 2009. *2009 California Climate Adaptation Strategy*.

European Fluorocarbons Technical Committee (EFCTC). 2003. *Fluorocarbons and Sulphur Hexafluoride: Perfluorocarbons (PFCs) Fact Sheet*. http://www.fluorocarbons.org/en/info/ brochures/ fact_10.html.

Monterey Bay Union Air Pollution Control District (MBUAPCD). 2011. *Agenda Item Number 20*. July 15, 2011.

Monterey County. 2008. *Monterey County General Plan Draft Environmental Impact Report*. September 2008

Pidwirny, M. 2006. *The Carbon Cycle: Fundamentals of Physical Geography*. 2nd Edition. http://www.physicalgeography.net/fundamentals/94.html.

Smith, James E. et al. 2006. *Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest types of the United States*. April 2006. http://www.treesearch.fs.fed.us/pubs/22954.

Staub Forestry and Environmental Consulting (Staub). 2006 *Forest Management Plan for Ferrini Ranch*. September 27, 2006.

U.S. Environmental Protection Agency (USEPA). 2005. url: http://www.epa.gov/ebtpages/ airairquality.html

U.S. Department of Agriculture (USDA). Forest Service.

2010a. *New Data Highlights Role of Forests in Fight Against Climate Change*. (Release No. 0532.10). October 15, 2010. http://www.fs.fed.us/rmrs/docs/foest-carbon/news-release.pdf.

2010b. Center for Urban Forest Research (*CUFR) Tree Carbon Calculator (CTCC)*. H:\Carbon Calculator\CCTC_Help.html

United States Environmental Protection Agency (USEPA). 2008. "SF6 Emission Reduction Partnership for Electric Power Systems: Basic Information." http://www.epa.gov/electricpower-sf6/basic.html.

2010a. "Nitrous Oxide." http://www.epa.gov/nitrousoxide/scientific.html.

2010b. "High Global Warming Potential Gases." http://epa.gov/highgwp/.

2010d. *PSD and Title V Permitting Guidance for Greenhouse Gases*.

2011a. "Climate Change – Greenhouse Gas Emissions: Carbon Dioxide." http://www.epa.gov/climatechange/emissions/co2.html.

2011b. "Methane."