5.8 GLOBAL CLIMATE CHANGE

This section identifies impacts associated with both short-term construction and long-term project operations that would potentially occur as a result of implementation of the proposed Plan, and how those impacts would influence and/or contribute to global climate change (GCC). Impacts are evaluated for their significance based on an evaluation of the project's consistency with Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. Mitigation measures required to reduce related impacts are recommended as appropriate. Although this section touches on air quality with respect to Global Climate Change, the reader is referred to Section 5.3, *Air Quality* for a more in depth discussion of this particular environmental issue area.

5.8.1 Environmental Setting

The Earth's climate has undergone many changes during its history, ranging from ice ages to long periods of warmth. Natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy from the sun have affected global temperatures and thus the Earth's climate. Climate change refers to any significant change in measures of climate (such as temperature, precipitation or wind) lasting for an extended period (decades or longer) (EPA 2008a). The term climate change is often used interchangeably with the term global warming; however, the phrase "climate change" is preferred as it helps convey that there are other changes in addition to rising temperatures (NAS 2008).

The Greenhouse Effect and Greenhouse Gases (GHG)

Heat retention within the atmosphere is an essential process to sustain life on Earth. The natural process through which heat is retained in the troposphere[1] is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere through a three-fold process, described as follows: 1) short-wave radiation emitted by the Sun is absorbed by the Earth; 2) the Earth reflects a portion of this energy in the form of long-wave radiation; and 3) greenhouse gases (GHGs), which are defined below, in the upper atmosphere absorb this long-wave radiation and reflect this long-wave radiation back toward the Earth. This "trapping" of the long-wave (thermal) radiation reflected back toward the Earth is the underlying process of the greenhouse effect. This natural process contributes to regulating the earth's temperature without which the

[1] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers (6.2 to 7.5 miles).

temperature of the Earth would be about zero degrees F (-18°C) instead of its present 57°F (14°C) (NCDC 2008).

Gases that trap heat in the atmosphere are often termed greenhouse gases. Principal GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O). Some greenhouse gases, such as CO_2, CH_4, and N_2O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Man-made GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFC), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3), which are associated with certain industrial products and processes. The major greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries; as such, it is virtually certain that atmospheric concentrations of greenhouse gases will continue to rise over the next few decades despite efforts to reduce future GHG emissions (EPA 2007).

It is generally agreed that human activity has been increasing the concentration of greenhouse gases in the atmosphere (mostly $CO_2$from combustion of coal, oil, and gas, and a few other trace gases) (NCDC 2008). The global atmospheric concentration of CO_2has increased from a pre-industrial value of about 280 ppm to 379 ppm in 2005 (IPCC 2007). Based on current projections, CO_2concentrations could reach between 490 to 1260 ppm by the end of the 21st century, 75 to 350 percent above the pre-industrial concentration (IPCC 2001).

A warming trend of approximately 1.0 to 1.7°F in average global temperatures occurred during the 20th century; warming occurred in both the northern and southern hemispheres, and over the oceans (IPCC 2007). According to the Intergovernmental Panel on Climate Change (IPCC), most of the warming in recent decades can very likely be attributed to human activities (IPCC 2007). There is much disagreement and uncertainty, however, concerning the magnitude and rate of future global warming. Specifically, the EPA notes that "important scientific questions remain about how much warming will occur, how fast it will occur, and how the warming will affect the rest of the climate system, including precipitation patterns and storms" (EPA 2007).

The effect each GHG has on climate change is measured as a combination of the volume or mass of its emissions, and the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP), and is expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of pounds or tons of "carbon dioxide equivalent" (CO_2E).

Contributions to Greenhouse Gas Emissions

Global

Anthropogenic (human-related) GHG emissions worldwide in 2005 totaled approximately 41,100 CO_2 equivalent million metric tons ($MMTCO_2E$)[2] (CAIT 2009). Six countries—China, United States, Russian Federation, India, Japan, Brazil—and the European Community accounted for approximately 60 percent of the total global emissions, or approximately 25,000 $MMTCO_2E$ (CAIT 2009).

United States

The United States was the second highest producer of greenhouse gas emissions in 2005, emitting 6,963.8 $MMTCO_2E$ (CAIT 2009). The primary greenhouse gas emitted by human activities in the United States was CO_2, representing approximately 84 percent of total greenhouse gas emissions. Carbon dioxide from fossil fuel combustion, the largest source of U.S. greenhouse gas emissions, accounted for approximately 80 percent of U.S. GHG emissions (EPA 2008b).

State of California

According to the 2004 GHG inventory data compiled by CARB for the California 1990 greenhouse gas emissions inventory, California emitted emissions of 484 $MMTCO_2E$, including emissions resulting from out-of-state electrical generation (CARB 2007b). The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. These primary contributors to California's GHG emissions and their relative contributions in 2004 are presented in Table 5.8-1, GHG Sources in California.

[2] The CO_2 equivalent emissions on a global or national scale are commonly expressed as "million metric tons of carbon dioxide equivalent ($MMTCO_2E$)" The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated Global Warming Potential (GWP) factor, such that $MMTCO_2E$ = (million metric tons of a GHG) x (GWP of the GHG). For example, the GWP for methane is 21. This means that emissions of one million metric tons of methane are equivalent to emissions of 21 million metric tons of CO_2.

Table 5.8-1
GHG Sources in California

Source Category	In-State & Related Out-of-State [a]		In-State Only [b]	
	Annual GHG Emissions ($MMTCO_2E$)	Percent of Total	Annual GHG Emissions ($MMTCO_2E$)	Percent of Total
Agriculture	27.9	5.8%	27.9	6.6%
Commercial Uses	12.8	2.6%	12.8	3.0%
Electricity Generation	119.8	24.7%	58.5	13.8%
Forestry (excluding sinks) [c]	0.2	0.0%	0.2	0.0%
Industrial Uses	96.2	19.9%	96.2	22.7%
Residential Uses	29.1	6.0%	29.1	6.9%
Transportation	182.4	37.7%	182.4	43.1%
Other [d]	16.0	3.3%	16.0	3.8%
Totals	**484.4**	**100.0%**	**423.1**	**100.0%**

Source: CARB 2007. Table based on the year 2004.
[a] Includes emissions associated with imported electricity, which account for 61.3 $MMTCO_2E$ annually.
[b] Excludes emissions associated with imported electricity.
[c] A sink is any process or activity or mechanism which removes a greenhouse gas or a precursor from the atmosphere. A forest or other area of vegetation can be considered a sink if it absorbs and stores large quantities of carbon dioxide from the atmosphere,
[d] Unspecified combustion and use of ozone-depleting substances.

Potential Effects of Human Activity on Climate Change

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place currently, including substantial ice loss in the Arctic (IPCC, 2007).

However, the scientific understanding of the effect of GHG emissions, particulate matter, and aerosols on global climate trends remains uncertain. In addition to uncertainties about the extent to which human activity (rather than solar or volcanic activity) is responsible for increasing warming, there is also evidence that some human activity has cooling rather than warming effects (IPCC, 2001).

Below is a summary of some of the potential effects reported by an array of studies that could be experienced in California as a result of global warming and climate change. The predicted magnitude of these effects depends on the future GHG global inventory (and controls on future emissions), the sensitivity of global climate models, and the influence of natural factors.

Air Quality

Higher temperatures, 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. For other pollutants, the effects of climate change and/or weather are less well studied, and even less well understood. If higher temperatures are accompanied 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, thus 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, 2006).

Water Supply

Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. Studies have found that, "considerable uncertainty about precise impacts of climate change on California hydrology and water resources will remain until we have more precise and consistent information about how precipitation patterns, timing, and intensity will change" (Kiparsky 2003). Even assuming that climate change leads to long-term increases in precipitation, the analysis of the impact of climate change is further complicated by the fact that no studies have identified or quantified the runoff impacts that such an increase in precipitation would have in particular watersheds (CCCC, 2006). Also, little is known about how groundwater recharge and water quality will be affected. Higher rainfall could lead to greater groundwater recharge, although reductions in spring runoff and higher evapotranspiration could reduce the amount of water available for recharge (CCCC, 2006).

The California Department of Water Resources (DWR) report on climate change and effects on the State Water Project (SWP), the Central Valley Project, and the Sacramento-San Joaquin Delta concludes that "climate change will likely have a

significant effect on California's future water resources . . . [and] future water demand," yet it also reports that much uncertainty about future water demand remains (DWR 2006). Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows (Kiparsky, 2003).

Hydrology

As discussed above, climate changes could potentially affect: the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has a $30 billion agricultural industry that produces half 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 ozone pollution could render plants more susceptible to pest and disease outbreaks (CCCC, 2006).

Ecosystems and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Soil moisture is likely to decline in many regions, intense rainstorms are likely to become more frequent, and sea level could rise as much as two feet along most of the U.S. coast. 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, 2004).

Potential Effects of Climate Change on the Proposed Plan

Sea Level Rise

Climate change is likely to accelerate the historical rise in sea level by increasing the volume of water contained in the oceans basins through thermal expansion of ocean water and the melting of polar ice and mountain glaciers. This in turn will affect coastal development, wetland resources, and recreation along the U.S. coast. The impacts of

sea-level rise will occur in coastal areas that are continually evolving and already face a wide range of natural and human-induced stresses, including erosion, storms, land subsidence, wetland loss, and environmental degradation from recreation and development pressures (PEW, 2000).

The West Coast in general has a lower vulnerability to sea-level rise than other areas in the United States such as such as the mid- and south-Atlantic states and along the Gulf Coast. Overall, the coastal zones of the West are least susceptible to sea-level rise impacts because of steeper average coastal profiles, geologic substrates composed of less erodible rock or glacial and riverine till, and lower rates of natural land subsidence.

Over the past century, sea level has risen nearly eight inches along the California coast, and general circulation model scenarios suggest very substantial increases in sea level as a significant impact of climate change over the coming century. Based on a set of climate scenarios prepared for the California Energy Commission's Public Interest Energy Research (PIER) Climate Change Research Program, project that, under medium to medium-high emissions scenarios, mean sea level along the California coast will rise from 1.0 to 1.4 meters (m) by the year 2100 (Cayan, et al., 2009).

In areas where the coast erodes easily, sea-level rise will likely accelerate shoreline recession due to erosion. The CCCC estimates that a 1.4 m sea-level rise will accelerate erosion, resulting in a loss of 41 square miles of California's coast by 2100 (CCCC, 2009). Rising sea level in response to climate change allows more wave energy to reach farther shoreward, increasing the potential for greater coastal impacts. Beach erosion, exacerbated by rising sea levels, can potentially have a serious impact on Southern California. Depending upon the rate that sea level rises during the twenty-first century, many beaches will shrink in width, and some beaches may disappear entirely.

Santa Ana Winds- Fire and Coastal Ecosystems

The cool, moist fall and winter climate of Southern California is often disrupted by dry, hot days with strong winds, known as Santa Anas, blowing out of the desert. The Santa Ana winds are a dominant feature of the fall and wintertime climate of Southern California and they have important ecological impacts (Conil and Hall, 2006). First, and most pronounced, is their influence on wildfires: following the hot, dry Southern California summer, the extremely low relative humidities and gusty strong winds that occur during Santa Anas introduce extreme fire risk which often culminates in wildfires with large economic loss (Westerling, et al., 2004). Less familiar but just as important is their impact on coastal-ocean ecosystems: The strong winds induce cold filaments in

sea-surface temperature (SST) with an associated increase in biological activity (Castro, et al., 2006; Trasvina, et al,. 2003).

A study conducted by the California Center for Climate Change investigates the response of the frequency and intensity of Santa Ana events to anthropogenic climate change; identifying Santa Ana wind events by the strength of the offshore wind through the gaps in Southern California's topography. The results indicate that as the climate begins to adjust to increased greenhouse gas forcing, the frequency of Santa Ana days is reduced. The study concluded that the number of Santa Ana days per winter season declines gradually over the 44-year reanalysis period, resulting in over 30% fewer events per year between 1991 and 2001 than between 1959 and 1969. The events per year are similarly reduced in the mid-twenty-first compared with the late-twentieth century, suggesting that the reduction seen in one models downscaling is at least partially caused by a change in the climate due to anthropogenic forcing (CCCC, 2006).

There are many societal implications of this anthropogenic reduction of Santa Ana wind events that could be significant. The role Santa Ana winds play in spreading wildfire in the region suggests their reduction in frequency could lead to reduced wildfire in Southern California (Westerling, et al., 2004). However, they still occur in the future climate. This study also has implications for coastal marine ecosystems, which respond favorably to Santa Ana conditions, and to the air quality in the Los Angeles basin, which is better during Santa Ana events. The reduction in Santa Ana wind events due to anthropogenic climate change is notable because it illustrates an observed and explainable regional change in climate due to plausible mesoscale processes (CCCC, 2006).

Regulatory Setting

International and Federal Activities

Kyoto Protocol

The United States is, and has been, a participant in the United Nations Framework Convention on Climate Change (UNFCCC) since it was signed on March 21, 1994. The Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. The original Kyoto Protocol was negotiated in December 1997 and came into force on February 16, 2005. As of November 2009, 189 countries and the European Economic Community (EEC) have ratified the agreement (UNFCCC, 2009). The goal of the protocol is to achieve overall emissions reduction targets for six GHGs by the period 2008 to 2012.

Massachusetts vs. EPA

On April 2, 2007, in *Massachusetts v. EPA*, 549 U.S. 497, the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act. The Court held that the EPA Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA Administrator is required to follow the language of section 202(a) of the Clean Air Act. On December 7, 2009, the Administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- The Administrator found that elevated concentrations of GHGs- CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6- in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the endangerment finding.

- The Administrator further found the combined emissions of GHGs- CO_2, CH_4, N_2O, and HFCs- from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the cause or contribute finding.

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act

Signed on December 19, 2007, the Act includes the following measures to aid in the reduction of national GHG emissions: 1) increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS), 2) set a target of 35.5 miles per gallon for the combined fleet of cars and light trucks by Model Year 2016, directs the National Highway Traffic Safety Administration to establish a fuel economy program for medium- and heavy-duty trucks, and 3) prescribe or revise standards affecting regional efficiency, energy conservation, energy efficiency labeling for consumer electronic products, efficiencies for residential boiler, heating/cooling products/home appliances.

State of California

AB 1493

Enacted on July 22, 2002, Assembly Bill 1493 (AB 1493, Pavley) required the California Air Resources Board (CARB) to set GHG emission standards for passenger vehicles, light-duty trucks, and other noncommercial personal transportation in the state manufactured in 2009 and all subsequent model years.

SB 1078

Approved in September 2002, Senate Bill 1078 (SB 1078, Sher) established the Renewal Portfolio Standard program, which requires an annual increase in renewable generation by the utilities equivalent to at least one percent of sales, with an aggregate goal of 20 percent by 2017 (see, also, SB 107 and Executive Orders S-14-08 and S-21-09 below).

Executive Order S-3-05

Executive Order S-3-05, signed in June 2005, established California's GHG emissions reduction targets, which include the following: 1) GHG emissions should be reduced to 2000 levels by 2010; 2) GHG emissions should be reduced to 1990 levels by 2020; and 3) GHG emissions should be reduced to 80 percent below 1990 levels by 2050. Under this Executive Order (EO), the Secretary of CalEPA created the Climate Action Team (CAT), which is comprised of representatives from several state agencies. The 2006 CAT Report identified a recommended list of strategies that the State could pursue to reduce climate change greenhouse gas emissions. A second draft biennial report, released in April 2009, expands on the policy oriented in the 2006 assessment, provides new information and scientific findings regarding the development of new climate and sea-level projections, and evaluates climate change within the context of broader soil changes, such as land use changes and demographics.

SB 107

Approved by Governor Schwarzenegger on September 26, 2006, SB 107 (Simitian) requires investor-owned utilities such as Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric, to generate 20% of their electricity from renewable sources by 2010. Previously, state law required that this target be achieved by 2017 (see SB 1078).

AB 32

In furtherance of the goals established in Executive Order S-3-05, the legislature enacted Assembly Bill 32 (AB 32, Nuñez and Pavley), the California Global Warming Solutions

Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. The GHG emissions limit is equivalent to the 1990 levels, which are to be achieved by 2020.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions. This program will be used to monitor and enforce compliance with the established standards. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

The first action under AB 32 resulted in the adoption of a report listing early action greenhouse gas emission reduction measures on June 21, 2007. The early actions include three specific GHG control rules. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. The original three adopted early action regulations meeting the narrow legal definition of "discrete early action GHG reduction measures" include:

1. A low-carbon fuel standard to reduce the "carbon intensity" of California fuels;
2. Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of "do-it-yourself" automotive refrigerants; and
3. Increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

The additional six early action regulations, which were also considered "discrete early action GHG reduction measures," include:

1. Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology;
2. Reduction of auxiliary engine emissions of docked ships by requiring port electrification;
3. Reduction of perfluorocarbons from the semiconductor industry;
4. Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products);
5. Require that all tune-up, smog check and oil change mechanics ensure proper tire

inflation as part of overall service in order to maintain fuel efficiency; and

6. Restriction on the use of sulfur hexafluoride (SF_6) from non-electricity sectors if viable alternatives are available.

As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMT CO_2E. In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of greenhouse gases for large facilities that account for 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California. About 800 separate sources fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit carbon dioxide in excess of specified thresholds.

On December 11, 2008, CARB approved the Scoping Plan to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and CAT early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. Additional development of these measures and adoption of the appropriate regulations will occur over the next two years, becoming effective by January 1, 2012. The key elements of the Scoping Plan include (CARB 2008):

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.

SB 1368

In September 2006, Governor Schwarzenegger signed SB 1368, which requires the California Energy Commission (CEC) to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly-owned utilities consistent with the standards adopted by the Public Utilities Commission. This effort will help to protect energy customers from financial risks associated with investments in carbon-intensive generation.

Executive Order S-1-07

Issued on January 18, 2007, Executive Order S-1-07 sets a declining Low Carbon Fuel Standard (LCFS) for GHG emissions measured in CO_2-equivalent gram per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020.

SB 97

In August 2007, the legislature enacted SB 97 (Dutton), which directs the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of greenhouse gas emissions. This bill also protects projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 from claims of inadequate analysis of GHG as a legitimate cause of action. This latter provision will be repealed on January 1, 2010. On June 19, 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents (OPR 2008). The advisory indicated that a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities, should be identified and estimated. The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures that are necessary to reduce GHG emissions to a less than significant level.

On April 13, 2009, OPR submitted to the Natural Resources Agency its proposed amendments to the state CEQA Guidelines relating to greenhouse gas emissions. On

July 3, 2009, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting the proposed amendments, starting the public comment period. The Natural Resources Agency is directed to adopt guidelines by January 1, 2010.

SB 375

Signed in September 2008, SB 375 (Steinberg) addresses GHG emissions associated with the transportation section through regional transportation and sustainability plans. By September 30, 2010, CARB will assign regional GHG reduction targets for the automobile and light truck sector for 2020 and 2035. Regional metropolitan planning organizations (MPOs) will be responsible for preparing a Sustainable Communities Strategy (SCS) within the Regional Transportation Plan to establish a development plan for the region, which will achieve, if feasible, the GHG reduction targets. SB 375 provides incentives for streamlining CEQA requirements by substantially reducing the requirements for "transit priority projects."

Executive Order S-13-08

Issued on November 14, 2008, this Executive Order is intended to hasten California's response to the impacts of global climate change, particularly sea level rise. It directs state agencies to take specified actions to assess and plan for such impacts and to prepare a Sea Level Rise Assessment Report by December 1, 2010. The final adaption strategies report was issued in December 2009 to assess the state's vulnerability, summarize key climate change impacts to the state, and recommend strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Executive Order S-14-08

Signed on November 17, 2008, Executive Order S-14-08 focuses on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. It requires that all retail suppliers of electricity in California serve 33 percent of their load with renewable energy by 2020 and directs state agencies to take appropriate actions to facilitate reaching this target.

Executive Order S-21-09

On September 15, 2009, Governor Schwarzenegger issued Executive Order S-21-09. This Executive Order directed CARB to adopt a regulation consistent with the goal of

Executive Order S-14-08 by July 31, 2010. CARB is further directed to work with the CPUC and CEC to ensure that the regulation builds upon the Renewable Portfolio Standard program and is applicable to investor-owned utilities, publicly-owned utilities, direct access providers, and community choice providers. Under this order, CARB is to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health and that can be developed most quickly in support of reliable, efficient, cost-effective electricity system operations.

Local

South Coast Air Quality Management District

The issue of global climate change is, by definition, a cumulative environmental impact. In accordance with the South Coast Air Quality Management District (SCAQMD) methodology, any project that produces a significant regional air quality impact in an area adds to the cumulative impact. The SCAQMD is the local air district responsible for establishing thresholds for air quality. To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, the SCAQMD has convened a GHG CEQA Significance Threshold Working Group. Currently the SCAQMD is in the process of establishing a threshold for GHG emissions to determine a project's regional contribution toward global climate change impacts for California.[3] In December 2008, the SCAQMD Governing Board adopted an interim GHG threshold for "industrial projects." However, this threshold applies only to projects for which the SCAQMD is the lead agency for CEQA purposes.

5.8.2 Impact Analysis

Thresholds of Significance

Neither the State of California nor the SCAQMD has established CEQA significance thresholds for GHG emissions from residential, commercial, or institutional projects. However, the OPR has issued a Technical Advisory regarding the evaluation of GHGs in CEQA documents (OPR, 2008). This advisory provides guidance to land use agencies in the interim period, until the State CEQA Guidelines are revised. The advisory states on page 4, in the third paragraph, "Public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from

[3] http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html

CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact." Furthermore, the advisory document indicates in the third bullet item on page 6 that "in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact', individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice."

Within this EIR, the following criterion is used for the purposes of identifying significant impacts associated with the Global Climate Change:

- Would the project create greenhouse gas emissions that would result in a conflict with State plans to achieve the goal of reducing greenhouse gas emissions pursuant to AB 32?

Impacts and Mitigation Measures

Quantification of GHG Emissions

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) published *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. This white paper is "intended as a resource, not a guidance document. It is not intended, and should not be interpreted, to dictate the manner in which an air district or lead agency chooses to address greenhouse gas emissions in the context of its review of projects under CEQA" (CAPCOA, 2008). This document describes analytical methodologies for estimating direct (mobile and area sources) and indirect (electrical and water/wastewater utilities) GHG emissions associated with a development project. For the most part, the calculation methods described below are consistent with this guidance as well as the OPR technical advisory (OPR, 2008).

Construction GHG Emissions

Construction of the proposed project would result in GHG emissions, which are primarily associated with use of off-road construction equipment and vehicles and on-road construction and worker vehicles. The URBEMIS 2007 model was used to calculate the annual CO_2 emissions based on the construction scenario described in Section 5.2. The model results were adjusted to estimate CH_4 and N_2O emissions in addition to CO_2. The CO_2 emissions from off-road equipment and on-road trucks, which are assumed by URBEMIS 2007 to be diesel fueled, were adjusted by a factor derived from the relative CO_2, CH_4, and N_2O for diesel fuel as reported in the

California Climate Action Registry's (CCAR) *General Reporting Protocol* (CCAR 2009) for transportation fuels and the GWP for each GHG. The CO_2 emissions associated with construction worker trips were multiplied by a factor based on the assumption that CO_2 represents 95% of the CO_2E emissions associated with passenger vehicles (EPA 2005). The results were then converted from annual tons per year to metric tons per year. Table 5.8-2, Estimated Construction GHG Emissions, presents construction emissions at each park site in the year 2010 (from three sources: off-road equipment, on-road trucks, and employee vehicles), as well as total Plan construction emissions.

Table 5.8-2

Estimated Construction GHG Emissions

	CO_2 tons/year	CO_2E MTons/year
Ramirez Canyon Park		
Off-Road Equipment	136	124
On-Road Trucks	15	0
Employee Vehicles	13	0
Total	***165***	***124***
Escondido Canyon Park		
Off-Road Equipment	112	102
On-Road Trucks	8	7
Employee Vehicles	15	14
Total	***135***	***124***
Latigo Trailhead		
Off-Road Equipment	87	80
On-Road Trucks	4	4
Employee Vehicles	13	12
Total	***104***	***96***
Corral Canyon Park		
Off-Road Equipment	123	113
On-Road Trucks	27	24
Employee Vehicles	17	16
Total	***167***	***153***
Malibu Bluffs		
Off-Road Equipment	163	149
On-Road Trucks	5	5
Employee Vehicles	23	22
Total	***191***	***175***

Table 5.8-2

Estimated Construction GHG Emissions

	CO_2 tons/year	CO_2E MTons/year
Ramirez Canyon/Delaplane Road Widening		
Off-Road Equipment	36	32
On-Road Trucks	3	3
Employee Vehicles	7	7
Total	***46***	***42***
Via Acero Road Improvements		
Off-Road Equipment	43	40
On-Road Trucks	2	1
Employee Vehicles	5	4
Total	***50***	***46***
Ramirez Creek Restoration/Enhancement		
Off-Road Equipment	44	40
On-Road Trucks	17	16
Employee Vehicles	9	8
Total	***70***	***65***
Combined Plan Area Total	**963**	**858**

Source: URBEMIS 2007. See Appendix E for complete results.
Mtons/year = metric tons per year. 1 metric ton = 1.1023 tons

As shown in Table 5.8-2, the estimated total GHG emissions during construction would be 963 tons, or 858 metric tons, in the year 2010. Additional detail regarding these calculations is found in *Appendix E*.

Operational GHG Emissions

Annual CO_2 emissions from motor vehicle trips for full project buildout in 2010 were quantified using the URBEMIS 2007 model. The daily CO_2 emissions were estimated for weekdays and weekends.

For purposes of full disclosure of potential environmental impacts, the analysis for GCC impacts associated with the use of Ramirez Canyon Park addresses the following two baseline scenarios:

1) Recreation/ Administration: The environmental setting assumes an environmental baseline of existing recreation and administrative uses and related

improvements associated with the Ramirez Canyon Park site as of the date of the Notice of Preparation.

2) Vacant Residential: The environmental setting assumes an environmental baseline of vacant residential uses and improvements historically associated with the Ramirez Canyon Park site prior to acquisition by the Conservancy/ MRCA.

Under the Recreation/ Administration Baseline scenario, to provide a conservative GHG emission estimate, both weekend days were assumed to include a special event at Ramirez Canyon Park (special events with 200 or more visitors generating no more than 64 additional trips above current levels). (See Section 5.3.2 for a discussion of the calculations for weekday, weekend, and special event emissions.)

Under the Vacant Residential Baseline (vacant residential estate compound) scenario, to provide a conservative GHG emission estimate, both weekend days were assumed to include a special event at Ramirez Canyon Park (special events with 200 or more visitors generating a maximum of 80 trips) (See Section 5.3.2 for a discussion of the calculations for weekday, weekend, and special event emissions.)

For both baseline scenarios, to calculate the annual emissions, the CO_2 emissions on 130 summer and 130 winter weekdays were added to the CO_2 emissions on 52 summer and 52 winter weekend days. The CH_4 and N_2O emissions were accounted for by multiplying the URBEMIS 2007 CO_2 emissions by a factor based on the assumption that CO_2 represents 95% of the CO_2 emissions associated with passenger vehicles (EPA 2005). The estimated GHG emissions from motor vehicles for each park site included in the proposed Plan, as well as the combined total, are shown in Table 5.8-3, Estimated Operational GHG Emissions under the Recreation/ Administration Baseline, and Table 5.8-4, Estimated Operational GHG Emissions under the Residential Baseline.

Table 5.8-3
Estimated Operational GHG Emissions
Under the Recreation/ Administration Baseline

	CO_2 lbs/year	CO_2E MTons/year
Ramirez Canyon Park (including Kanan Dume Parking)	2,229,738	1,065
Escondido Canyon Park	676,110	323
Latigo Trailhead	423,781	202
Corral Canyon Park	907,367	433
Malibu Bluffs	2,390,034	1,141
Total	**6,627,028**	**3,164**

Source: URBEMIS 2007. See Appendix E for complete results.
Lbs/year = pounds per year; Mtons/year = metric tons per year
1 metric ton = 2,204.623 lbs

Table 5.8-4
Estimated Operational GHG Emissions
Under the Vacant Residential Baseline

	CO_2 lbs/year	CO_2E MTons/year
Ramirez Canyon Park (including Kanan Dume Parking)	3,053,592	1,458
Escondido Canyon Park	676,110	323
Latigo Trailhead	423,781	202
Corral Canyon Park	1,247,386	596
Malibu Bluffs	2,390,034	1,141
Total	**7,790,903**	**3,720**

Source: URBEMIS 2007. See Appendix E for complete results.
Lbs/year = pounds per year; Mtons/year = metric tons per year
1 metric ton = 2,204.623 lbs

Table 5.8-3, above, indicates that the implementation of the proposed Plan under the Ramirez Canyon Park Recreation/ Administration baseline would result in a net increase of 3,164 metric tons of CO_2E annually. Table 5.8-4, above, indicates that the implementation of the proposed Plan under Ramirez Canyon Park Residential baseline would result in a total of 3,720 metric tons of CO_2E annually. Under the Recreation/ Administration scenario, Malibu Bluffs would generate the greatest increase in GHG

emissions, 1,141 metric tons of CO_2E, as it would provide the most parking spaces and campsites; thus, generating the highest traffic volumes. Under the Vacant Residential scenario, Ramirez Canyon would generate the greatest increase in GHG emissions, 1,458 metric tons of CO_2E. It should be noted that these GHG emission estimates are conservative because they are based on the assumption that all weekend days would include special event levels of vehicle trips.

Impacts Discussion

As stated above, the proposed project's contribution to state, national, and global GHG emission inventories, and the resultant effect on global climate, should be evaluated on a cumulative basis. Construction of the Plan improvements would result in one-time GHG emissions. Operation of the proposed Plan would result in annual mobile vehicle-generated greenhouse gas associated with vehicular travel to and from the park sites, but would not result in cumulatively considerable area source emissions, as described in Section 5.3, *Air Quality*.

In addition, the proposed park improvements and the park patrons will be subject to many of the measures to be adopted pursuant to the AB 32 Scoping Plan, including but not limited to GHG emission standards for passenger vehicles and light trucks, the Low Carbon Fuel Standard, and more stringent energy conservation standards.

The Climate Change Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32. The Scoping Plan recommendations serve as statewide strategies to reduce the state's existing GHG emissions and proposed project's contributions. Although a framework for the adoption of specific regulations and measures, the Scoping Plan is the current state's plan to reduce GHG emissions. Table 5.8-5, Project Consistency with Scoping Plan GHG Emission Reduction Strategies, highlights measures to be developed under the Scoping Plan that would be applicable to the proposed project or its users. The proposed project's consistency with the applicable Scoping Plan measures is assessed below.

Table 5.8-5

Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Description	Project Consistency
Pavley Motor Vehicle Standards (AB 1493)	T-1	The motor vehicle standards apply to new passenger vehicles and light trucks and would reduce GHG emissions up to 30%.	The proposed project's users and employees would purchase vehicles in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase.
Low Carbon Fuel Standard	T-2	The low carbon fuel standard reduces at least 10% in the "carbon intensity" of California's transportation fuels by 2020.	Motor vehicles driven by the project user's and employees would use compliant fuels in the future.
Building Energy Efficiency Standards	E-1	Measure would maximize energy efficiency building and appliance standards and pursue additional efficiency efforts including new technologies	Buildings construction within the parks would be required to meet the energy standards at the time of building construction.
Renewable Portfolios Standard (33% by 2020)	E-3	The measure would require that 33% of the energy generated by the state's electricity providers be obtained from renewal energy sources.	The electricity used by the proposed project will benefit from reduced GHG emissions resulting from increased use of renewable energy sources.

Source: CARB 2009. "Scoping Plan Measures Implementation Timeline."
Accessed October 23, 2009 at: http://www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf

In addition to the statewide strategies listed above, the proposed Plan would also include policies that would result in a reduction of GHG emissions, which are briefly discussed below. The following briefly describes characteristics of the proposed project that would result in a reduction of GHG emissions relative to "business as usual."

Uninterrupted Park Connection Via Trail System and Increased Non-vehicle Travel

One of the main goals of the Plan is to "encourage non-vehicular circulation between park areas over vehicular use and emphasize pedestrian circulation between park areas

and the shoreline as a primary form of circulation." The proposed Plan provides policies and implementation actions to complete trail connections for the Coastal Slope Trail and other connector trails through the Plan area, which include trail connections from Kanan Dume Road to Ramirez Canyon Park, Escondido Canyon Park and the Latigo Trailhead, through Solstice Canyon Park, and finally to Corral Canyon Park. The Plan further provides for completing the Beach to Backbone Trail, which includes a continuous trail corridor through Corral Canyon from Dan Blocker County Beach in the City to the Santa Monica Mountains "ridgeline" in Malibu Creek State Park, and creating additional Beach to Bluffs trails on the Malibu Bluffs area. The Plan provides methods for establishing trail connections and filling "missing links" of the Coastal Slope Trail and connector trails.

The interconnection of the existing trail system within the Plan area would increase pedestrian access throughout each park, as well as in between each park. Currently, as trail segments that link each park are unavailable and/or incomplete, visitors of the Santa Monica Mountains in the Malibu recreational area are required to travel by vehicle to move from one park to another, or from a number of the parks to the shoreline. Although each proposed park improvement would generate traffic trips from visitors; persons would have the ability to travel by foot, wheelchair, or other alternative means to the other proposed park improvements versus utilizing their vehicle.

The increase in non-vehicular circulation between park areas would reduce GHG emissions that would otherwise be generated by motor vehicles.

Provision of Campsites to Serve City of Los Angeles & Surrounding Cities

Table 5.8-6 presents the estimated distance from the City of Los Angeles to the proposed Plan park improvement sites and indicates which campgrounds would be located near the ocean and/or provide blue water views, as well as which park would provide handicap accessible campsites.

Table 5.8-6

Proposed Campgrounds

Park	Distance from Los Angeles, CA* (miles)	Estimated Travel Time	Ocean Proximity/ Blue Water Views	Handicap Accessible
Ramirez Canyon Park	36	50 min		✓
Escondido Canyon Park	33	43 min		✓
Latigo Trailhead	32	42 min	✓	✓
Corral Canyon Park	31	40 min	✓	✓
Malibu Bluffs	30	39 min	✓	✓
Average	***32***	***43 min***		

*Distance measured from Los Angeles City Hall at 200 North Spring Street, Los Angeles 90012

As indicated in Table 5.8-6, the average distance from the centralized Los Angeles location to the proposed Plan park sites would be 32 miles. All five parks would provide handicap accessible campgrounds and three of the parks would be located near the ocean and/or provide blue water views.

Table 5.8-7 presents existing campgrounds located near the Los Angeles area. Campgrounds listed are considered to be either located within the Los Angeles region or located a reasonable distance from Los Angeles and thereby accessible by car. All campsites are located within 115 miles, with a travel time of less than 3 hours. The campgrounds selected below are partially based on SAIC's "Public Need for Recreation" analysis (SAIC, 2008), prepared in response to the Santa Monica Mountains Conservancy's "Public Access and Recreation – Current Demand and Proposed Overlay Goals " report, as part of their amendment proposal to incorporate the Malibu Parks Public Access Enhancement Plan Overlay District in the City of Malibu Local Coastal Program (SMMC 2008).

Table 5.8-7
Campgrounds Near the Los Angeles Area

Park	Distance from Los Angeles, CA* (miles)	Estimated Travel Time	Ocean Proximity/ Blue Water Views	Handicap Accessible
Campo Alto, Maricopa, CA	98	2 hr		
Chuchupate, Maricopa, CA	80	1 hr 28 min		
Chula Vista, Frazier Park, CA	90	1 hr 51min		
Half Moon, Maricopa, CA	97	2 hr 8 min		
McGill, Frazier Park, CA	87	1 hr 42 min		✓
Mt. Pinos, Maricopa, CA	88	1 hr 45 min		
Ozena, Ojai, CA	102	2 hr 6 min		
Pine Springs, Ojai, CA	90	1 hr 45 min		
Wheeler Gorge, Ojai, CA	90	1 hr 34 min		✓
Reyes Peak**, Ojai, CA	115	2 hr 40 min		
Leo Carillo State Park, CA	44	59 min	✓	✓
Point Mugu State Park, Malibu, CA	52	1 hr 19 min	✓	✓
Emma Wood State Beach, Ventura, CA	69	1 hr 9 min	✓	
Topanga State Park, Topanga, CA	28	36 min		
Castaic Lake State Recreation Area, CA	47	52 min		
Placerita Canyon State Park, Newhall, CA	33	35 min		
McGrath State Beach, Oxnard, CA	66	1 hr 9 min	✓	✓
Decker Canyon, Lake Elsinore, CA	75	1 hr 24 min		
Average	***71***	***1 hr 23 min***		

*Distance measured from Los Angeles City Hall at 200 North Spring Street, Los Angeles 90012
**Reyes Peak campground located in Ojai, California provides partial ocean views from the ridgeline of Pine Mountain. As this location is located over 40 miles inland, it is not considered to provide the coastal experience similar to other parks listed.
hr = hour; min = minute

As represented in Table 5.8-7, the distance from Los Angeles to existing campgrounds in the area ranges from 28 to 115 miles, with the more than 10 campgrounds located farther than 70 miles. The majority of these campgrounds do not provide a camping

experience near the ocean or blue water views from camping or surrounding trail locations; even fewer provide handicap accessible campsites.

The closest campgrounds to the Los Angeles area that are located in proximity to the ocean and/or provide blue water views consist of Leo Carrillo State Park (44 miles), Point Mugu State Park (52 miles), Emma Wood State Park (69 miles), and McGrath State Beach (66 miles). The proposed Plan campground improvements would be the closest coastal campgrounds to the Los Angeles area with an average distance of 32 miles to the park site.

The closest campgrounds to the Los Angeles area that provide handicap accessible camping are located at Half Moon (87 miles), Wheeler Gorge (90 miles), Leo Carrillo State Park (44 miles), Point Mugu State Park (52 miles), and McGrath State Beach (66 miles). As with the provision of a coastal camping experience, the proposed Malibu Parks improvements would provide the closest handicap accessible campgrounds to the Los Angeles area.

As stated above, the majority of the greenhouse gas emissions generated by the proposed park improvements are a result of vehicles traveling to Plan area. However, the project would not result in additional population and would only serve to entice existing and future populations from the Los Angeles area, those seeking coastal-related camping and recreational opportunities (including handicap accessible opportunities), to travel less. Therefore, although the proposed Plan would result in motor-vehicle GHG emissions, it would likely reduce future GHG emissions by reducing trip lengths from Los Angeles for those in the population seeking coastal-related camping and recreational opportunities (including handicap accessible opportunities).

Impact GCC-1: Implementation of the proposed project would generate GHG emissions that would contribute to cumulative impacts of GHG emissions on global climate. While all sources of GHG emissions contribute to some extent to global climate change, the amount of GHG emissions generated by the proposed project will not likely impede or conflict with the State's ability to achieve the goals of AB 32; associated impacts would be less than significant.

Implementation of the proposed project would generate GHG emissions that would contribute to cumulative impacts of GHG emissions on global climate. For comparative purposes, the proposed project's contribution to the State's total emissions would be

less than 0.001%. The development of the proposed Plan would provide pedestrian trails interconnecting the Malibu parks and camping opportunities closer to the Los Angeles area, both of which would reduce GHG emissions associated with motor vehicle trips relative to "business as usual" without implementation of the proposed Plan. While all sources of GHG emissions contribute to some extent to global climate change, the proposed project will not likely impede or conflict with the State's ability to achieve the goals of AB 32 for the reasons discussed above. Therefore, the proposed project would not result in a cumulatively considerable contribution to global climate change; associated impacts would be *less than significant*.

Mitigation Measures

As no significant cumulative impacts relating to Global Climate Change are identified, no mitigation measures are required.

Residual Impacts

The proposed Plan's contribution to global climate change impacts would be ***less than significant (Class III).***

<u>Analysis of Impacts Post-Mitigation</u>

Impact GCC-2: ***Implementation of mitigation measures intended to reduce impacts associated with the proposed Plan's improvements would result in less than significant impacts on global climate change.***

In addition to analysis of the project (as proposed), CEQA requires that an EIR discuss the environmental impacts associated with the implementation of any required mitigation. This section, therefore, evaluates how mitigation measures required in other sections of this EIR would affect global climate change. Required mitigation measures to reduce the Plan's environmental impact that would potentially result in impacts to global climate change include off-site biological mitigation measures, described in detail in Section 5.4, *Biological Resources*.

Habitat restoration would be conducted at four sites: Malibu Bluffs, Corral Canyon, Tuna/Las Flores Canyon, and King Gillette Ranch (see *Appendix H-2*). Potential impacts to global climate change are similar to those discussed in Section 5.2, *Air Quality*. GHG emissions generated by the proposed biological mitigation would be associated with

short-term construction activity required to implement the restoration sites and long-term monitoring.

It is reasonable to assume that construction activity at each biological mitigation site would be performed primarily by hand labor and would not require extensive use of heavy equipment, if any. As such, GHG emissions from mechanized equipment exhaust would be nominal. In the event that restoration would require a more intensive construction approach, Mitigation Measures described under AQ-1 would ensure that potential construction-related GHG emissions would be reduced to the maximum extent feasible. Vehicular emissions associated with construction worker travel would be short-term and minimal.

Long-term operational GHG emissions resulting from biological mitigation would be limited to occasional vehicular travel generated by a landscape maintenance contractor during the 5-year maintenance and monitoring program that would be implemented on all mitigation sites to ensure successful implementation of the habitat mitigation program. It is anticipated that emissions associated with maintenance would be negligible.

Potential beneficial impacts associated with biological restoration sites is associated with increased vegetation, which removes air pollutants and greenhouse gas emissions through dry deposition and carbon sequestration and storage. Successful restoration of disturbed areas would result in additional plant coverage, which has the potential to store atmospheric CO_2.

Residual Impacts

Implementation of mitigation measures intended to reduce impacts associated with the proposed Plan's improvements would result in a **less than significant (Class III)** cumulative contribution to GHG emissions that would contribute to global climate change.