3.5
CLIMATE CHANGE

This section of the Draft EIR summarizes the relevant environmental setting in terms of greenhouse gas (GHG) emissions; identifies potential climate change impacts from project implementation; and evaluates the significance of those potential impacts. This analysis is based on the results of air quality modeling using URBEMIS 2007 conducted in support of the Fairview/Gavilan College Air Quality Study (Illingworth & Rodkin 2007), prepared for the *Gavilan San Benito Campus and Fairview Corners Projects Final EIR*. The URBEMIS model run results utilized in the analysis of climate change are included in Appendix G along with calculations supporting the information presented in this section. Additional information currently available from a number of state agencies, most notably the California Air Resources Board (CARB); legislation adopted by the state; and guidance provided by the California Attorney General's Office was also utilized.

3.5.1 ENVIRONMENTAL SETTING

Greenhouse Gas Emissions & Climate Change

The Earth's atmosphere has been warming for the past century. It is believed this warming trend is related to the release of certain greenhouse gas (GHG) emissions into the atmosphere. GHG emissions are naturally occurring gases such as water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) that regulate the temperature on the Earth by absorbing infrared energy that would otherwise escape from the Earth's atmosphere. As the infrared energy is absorbed, the air surrounding the Earth is heated. In addition to natural sources, human activities are exerting a major and growing influence on climate by changing the composition of the atmosphere and by modifying the land surface. Particularly, the increased consumption of fossil fuels (natural gas, coal, gasoline, etc.) has substantially increased atmospheric levels of

GHGs. GHGs most typically associated with land development projects include emissions of CO_2 and, to a lesser extent, CH_4, O_3, chlorofluorocarbons (CFCs), and N_2O, as discussed further below.

Ozone (O_3) occurs naturally in the stratosphere where it is largely responsible for filtering harmful ultraviolet (UV) radiation. In the troposphere, ozone acts as a GHG by absorbing and re-radiating the infrared energy emitted by the Earth. As a result of the industrial revolution and rising emissions of NO_x and VOCs (ozone precursors), the concentrations of ozone in the troposphere have increased compared to the pre-industrial era. (IPCC, *Climate Change 2007: The Physical Science Basis, Summary for Policymakers* (2007)). Due to the short life span of ozone in the troposphere, its concentration and contribution as a GHG is not well established. No 100-year global warming potential has been established for ozone or NO_x. However, the greenhouse effect of tropospheric ozone is considered small, as the radiative forcing of ozone is 35 percent of that of carbon dioxide. *Id*. For these reasons, ozone is not a state-regulated GHG and therefore is not analyzed further in this Draft EIR.

Based on currently available information, global GHG emissions resulting from human activities, especially the consumption of fossil fuels, have grown since pre-industrial times with an increase of approximately 70 percent between 1970 and 2004 (IPCC 2007). An overall warming trend has been recorded since the late 19th century, with the most rapid warming occurring over the past two decades. The 10 warmest years of the last century all occurred within the last 15 years. It appears that the decade of the 1990s was the warmest in human history. Most of the warming in recent decades likely occurred from human activities that resulted in increased GHG emissions.

There are uncertainties as to exactly what the climate changes will be in various geographical areas of the Earth, and what effects clouds will have in determining the rate at which the mean temperature will increase. The International Panel on Climate Change (IPCC) has declared that worldwide, average temperatures are likely to increase by approximately 3 to 7 degrees Fahrenheit by the end of the 21st century. However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the Earth. Regional climate changes are dependent on multiple variables, such as topography. One region of the Earth may experience increased temperatures, increased incidents of drought, and similar warming effects, whereas another region may experience a relative cooling.

There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet, including: sea level rise; spread of certain diseases out of their usual geographic range; the effect on agricultural production, water supply, and sustainability of ecosystems; increased strength and frequency of storms; extreme heat events; air pollution episodes; and the consequence of these effects on the economy (CARB 2008).

In California, as discussed in a report prepared by the California Climate Change Center (2006) and a report by Moser *et al* (2009), climate change may result in consequences including the following:

- Unpredictable weather: The years of 1995-2005 had the warmest global temperature ever recorded in human history, measured since 1850 (Rosenzweig et al. 2007). Combined with longer summer seasons, the increased temperature will reduce soil moisture levels, which will increase irrigation needs, increase the need for air conditioning use, increase the rate and spread of wildfires, and stress the electrical infrastructure.

- Increased rate of wildfires: Wildfire risk is based on a combination of factors including precipitation, winds, temperature, and vegetation, all of which are susceptible to the impacts of increased warming. Wildfires are likely to grow in number and size throughout the state as a result of increased temperatures induced by climate change. Even under the 'medium' warming scenario predicted by the IPCC, wildfire risk will likely increase by 55 percent in California.

- Deteriorating public health: Heat waves are expected to have a major impact on public health as well as decreasing air quality and increasing mosquito-breeding and mosquito-borne diseases. In particular, the elderly and young, and those vulnerable populations that do not have the resources to deal with the costs and adapt to the changes that are expected to impact the community, will need assistance.

- Decreasing supply and quality of fresh water: Warmer average global temperatures cause more rainfall than snowfall, making the winter snowfall season shorter and accelerating the rate at which the snow packs melt in the spring. The change to a liquid-precipitation-centric system has the potential to reduce storage capacity, water quality, and the accessibility of water for emergencies. With rain and snow events becoming less predictable and more variable, this could increase the rate of flooding and decrease the ability to maintain fresh water for consumption.

- Increased residential electricity demands for cooling: Warming temperatures are predicted to cause significant increases in residential electricity demand for cooling in summer months, especially for residential developments built in warm, inland areas. Coupled with the negative impacts of increased temperatures on electrical infrastructure and of earlier spring snowmelt on hydropower production, climate change could have significant impacts on energy supply in California.

- Reductions in the quality and quantity of certain agricultural products: Crops and food products that are likely to be hard hit include wine grapes, fruits, nuts, and milk.

- A rise in sea levels resulting in the displacement of coastal businesses and residences: During the past century, sea levels along California's coast have risen about 7 inches. If heat-trapping emissions continue unabated and temperatures rise into the higher warming range, sea level is expected to rise an additional 16 to 55 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.
- Damage to marine ecosystems and the natural environment.
- A decrease in the health and productivity of California's forests.

Although certain environmental effects are widely accepted to be potential hazards to certain locations, such as rising sea level for low-lying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location, and thus would be speculative to do so.

Greenhouse Gases

The human-produced GHGs most responsible for global warming and their relative contribution to it are CO_2, CH_4, near surface ozone (O_3), N_2O, and chlorofluorocarbons (CFCs). The relative global contribution of these types of GHGs to global warming is summarized in Table 12, GHG Types and Their Contribution to Global Warming.

Table 12 GHG Types and Their Contribution to Global Warming

Carbon dioxide (CO_2)	53 percent
Methane (CH_4)	17 percent
Near Surface Ozone (O_3)	13 percent
Nitrous Oxide (N_2O)	12 percent
Chlorofluorocarbons (CFCs)	5 percent

Source: California EPA, March 2006

Each type of GHG has a different capacity to trap heat in the atmosphere and each type remains in the atmosphere for a particular length of time. The ability of a GHG to trap heat is measured by an index called the global warming potential. CO_2 is considered the baseline GHG in this index and has a global warming potential of one (1). CH_4 has a global warming potential of 21 times that of CO_2, and N_2O has a global warming potential of 310 times that of CO_2. The families of CFCs, including chlorofluorocarbons, hydrofluorocarbons and perfluorocarbons,

have a substantially greater global warming potential than other GHGs, generally ranging from approximately 1,300 to over 10,000 times that of CO_2. While CO_2 represents the vast majority of the total volume of GHGs released into the atmosphere, the release of even small quantities of other types of GHGs can be significant for their contribution to climate change.

State law defines GHGs to include the following compounds:

Carbon Dioxide (CO_2). CO_2 is an odorless and colorless GHG. CO_2 is emitted from natural and anthropogenic (man-made) sources. Natural sources include: the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include: the burning of coal, oil, natural gas and wood. CO_2 is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks. The IPCC indicates that since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO_2 concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30 percent. Left unchecked, the concentration of CO_2 in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources. CO_2 is the most widely emitted GHG and is the reference gas (GWP of 1) for determining the GWP of other GHGs. In 2004, 82.8 percent of California's GHG emissions were CO_2 (California Energy Commission 2008).

Methane (CH_4). CH_4 has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of CH_4. Other anthropogenic sources include fossil fuel combustion, biomass burning, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of CH_4 are landfills, natural gas systems, and enteric fermentation (US EPA n.d.[a]). CH_4 is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. CH_4 is an extremely effective absorber of radiation, though its atmospheric concentration is less than CO_2 and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs. The GWP of methane is 21.

Nitrous oxide (N_2O). N_2O, also known as laughing gas, is a colorless GHG. It is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant (e.g., in whipped cream bottles). It is

also used in potato chip bags to keep chips fresh, as well as in rocket engines and race cars. N_2O can be transported into the stratosphere, be deposited on the Earth's surface, and be converted to other compounds by chemical reaction. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. Concentrations of N_2O also began to rise at the beginning of the industrial revolution. The Intergovernmental Panel on Climate Change (IPCC) indicates that the global concentration of N_2O was 314 parts per billion (ppb) in 1998. The GWP of nitrous oxide is 310.

Hydrofluorocarbons (HFCs). HFCs typically are used as refrigerants in both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam-blowing is growing particularly as the continued phase-out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs ranges from 140 for HFC-152a to 6,300 for HFC-236fa.

Perfluorocarbons (PFCs). PFCs are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. PFCs are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years) (Energy Information Administration 2007). The GWPs of PFCs range from 5,700 to 11,900.

Sulfur Hexafluoride (SF_6). SF_6 is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 is the most potent GHG that has been evaluated by the IPCC with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio, as compared to CO_2 (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm] of CO_2) (US EPA n.d.[b]).

Greenhouse Gas Inventories

World/U.S. Estimates of GHG Emissions. GHG emissions are often expressed as "CO_2 equivalent" or CO_2e, which is defined as the weight of CO_2 released into the atmosphere having the same estimated global warming potential as a given weight of another gas. It is computed by multiplying the weight of gas (methane, for example) by its global warming potential (21 for CH_4). This allows GHG emissions volumes to be standardized against CO_2. Data compiled by the United Nations Framework Convention on Climate Change indicates that, in 2006, total worldwide GHG emissions were estimated to be 22,170 million metric tons of carbon dioxide equivalent ($MMTCO_2e$), excluding emissions/removals from land use, land use change, and forestry. GHG emissions in the U.S. were 7,054.2 $MMTCO_2e$.

California GHG Emissions Inventory. In 2006, GHG emissions in California were estimated to be 483.9 $MMTCO_2e$, although in 2008 (the latest year that emissions data is available), GHG emissions had decreased to 473.76 $MMTCO_2e$. California is a substantial contributor of global GHG emissions, being the second largest contributor in the United States and the sixteenth largest in the world. However, while California's GHG emissions inventory is large, with its relatively large size and population base, it has low emissions per capita compared to other states.

3.5.2 REGULATORY SETTING

International and Federal

In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change (IPCC) to assess "the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation."

In March 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

A particularly notable result of the United Nations Framework Convention on Climate Change efforts is a treaty known as the Kyoto Protocol, which went into effect in February 2005. When countries sign the Protocol, they demonstrate their commitment to reduce their emissions of GHGs or engage in emissions trading. More than 170 countries are currently participating in the Protocol. Industrialized countries are required to reduce their GHG emissions by an average of 5 percent below their 1990 levels by 2012. In 1998, United States Vice President Al Gore symbolically signed the Protocol; however, in anticipation of the signing, the U.S. Senate approved a non-binding "Sense of the Senate" resolution in July 1997 by a margin of 95-0 that expressed opposition to the treaty's provisions, most notably the disparity in GHG emissions reduction obligations between industrialized nations and developing nations. In 2001, President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. Since that time, in December 2009 and 2010, international leaders met in Copenhagen and Mexico City to address the future of international climate change commitments post-Kyoto.

Coinciding with the opening of the Copenhagen Climate Conference, in December 2009, the EPA issued an Endangerment Finding under Section 202(a) of the Clean Air Act, opening the door to federal regulation of GHGs. The Endangerment Finding notes that GHGs threaten public health and welfare and are subject to regulation under the Clean Air Act. The final findings were published in the Federal Register on December 15, 2009 and became effective on January 14, 2010.

Federal regulation of GHGs can occur through other means, such as fuel efficiency standards. President Obama put into motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. The new standards would cover model years 2012 through 2016, and would require an average fuel economy standard of 35.5 miles per gallon in 2016. The U.S. EPA and the National Highway Traffic Safety Administration, on behalf of the U.S. Department of Transportation (DOT), released a notice of intent to conduct joint rulemaking to establish vehicle GHG emissions and fuel economy standards in May 2009. The final standards were adopted by the U.S. EPA and the DOT on April 1, 2010.

State

There have been significant legislative and regulatory activities that affect climate change and GHGs in California. Relevant legislation is discussed below.

Title 24

Although it was not originally intended to reduce GHGs, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Non-Residential Buildings, was first adopted 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 efficient technologies and methods. The latest amendments were adopted and approved in 2008, and aim to reduce the State's GHGs to 1990 levels, consistent with AB 32 (discussed below). The requirement for when the 2008 standards must be followed is dependent on when the application for the building permit is submitted. That is, if the application is submitted on or after January 1, 2010, the 2008 standard must be met.

California Green Building Standards Code

The California Green Building Standards Code was adopted in January 2009. The purpose of this Code is to improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories:

- Planning and design
- Energy efficiency
- Water efficiency and conservation
- Material conservation and resource efficiency
- Environmental air quality

The Code addresses exterior envelope, water efficiency, and material conservation components. The aim is to reduce energy usage in non-residential buildings by 20 percent by 2015 and help meet reductions contemplated in AB 32. With the 2008 Building Code, a 15 percent energy reduction over the 2007 edition is expected. Compliance became mandatory as of January 1, 2011.

AB 1493

The Clean Air Act allows California to adopt and implement vehicle emission standards that are more stringent than federal standards so long as the U.S. EPA grants California a waiver. California Assembly Bill 1493 (Pavley), enacted in July 2002, required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. The CARB is the state agency charged with monitoring and regulating sources of GHG emissions that cause global warming. Regulations adopted by the CARB apply to vehicles that are a model year of 2009 or later. The CARB estimates that the Pavley regulations would reduce GHG emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030. However, implementation of the Pavley regulations was stalled by automaker lawsuits and by the U.S. EPA's refusal to grant California an implementation waiver to allow California to enforce AB 1493. President Obama asked the U.S. EPA to review its denial of the waiver and the EPA granted it in June 2009. In light of the U.S. EPA and NHTSA standards, California – and states adopting California's emissions standards – have agreed to defer to the national standard through model year 2016. The 2016 endpoint of the two standards is similar, although the national standard ramps up slightly more slowly than required under the California standard. The AB 1493 standards require additional reductions in CO_2 emissions beyond 2016 (referred to as Phase II standards), which are expected to be drafted in late 2011.

Executive Orders S-3-05, S-20-06 and S-01-07

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05, which established the following reduction targets for GHG emissions:

- By 2010, reduce GHG emissions to 2000 levels;

- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established as an aggressive, but achievable, mid-term target. To meet these targets, the Governor directed the Secretary of the California EPA to lead a Climate Action Team made up of representatives from the Business, Transportation, and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the CARB; the Energy Commission; and the Public Utilities Commission. The Climate Action Team's Report to the Governor in 2006 contained recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

In 2006, this goal was reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. As discussed further below, AB 32 sets the same overall GHG emissions reduction goals while also mandating that the CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." AB 32 also requires that the CARB develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels. Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team (CARB 2008).

Executive Order S-01-07 was signed by the Governor in January 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

Global Warming Solutions Act of 2006 (AB 32)

Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006 (Health and Safety Code, Division 25.5, commencing with Section 38500), creates a comprehensive, multi-year program to reduce GHG emissions in California, with the overall goal of restoring emissions to 1990 levels by the year 2020, and an 80 percent reduction below 1990 levels by 2050.

AB 32 does not contain detailed control measures. Instead, it creates statewide GHG limits and then requires those limits be met via sector-specific GHG emission reduction measures, to be developed and implemented by the CARB.

In accordance with AB 32, the CARB has been directed to develop and implement regulations to reduce statewide GHG emissions. AB 32 does not explicitly apply to emissions from land development. However, GHG emissions associated with land development projects can result in

direct and indirect emissions within individual end-use sectors, including transportation and energy. As a result, GHG emissions associated with development projects will ultimately factor into emission reduction considerations.

There are four major components of AB 32. First, it requires the CARB to prepare an emissions inventory by using the best available economic, scientific, and technological information on GHG emissions to determine the statewide GHG levels in 1990, and to approve a statewide GHG limit equivalent to that level to be achieved by 2020. The 2020 GHG emissions limit, which was approved by the CARB in December 2007, is 427 million metric tons of CO_2.

To achieve this objective, an approximately 29 percent reduction from the "business-as-usual" projections is required. Under the current "business as usual" scenario, statewide emissions are increasing at a rate of approximately 1 percent per year as noted below. Also shown are the average reductions needed from all statewide sources (including all existing sources) to reduce GHG emissions back to 1990 levels.

- 1990: 427 MMTCO2e
- 2004: 480 MMTCO2e (an average 11-percent reduction needed to achieve 1990 base)
- 2008: 495 MMTCO2e (an average 14-percent reduction needed to achieve 1990 base)
- 2020: 596 MMTCO2e Business as Usual (an average 29-percent reduction needed to achieve 1990 base)

The 2020 business-as-usual forecast does not take any credit for reductions from measures included in the AB 32 Scoping Plan, including the Pavley GHG standards for vehicles, full implementation of the Renewable Portfolio Standard beyond current levels of renewable energy, or the solar measures.

Second, AB 32 includes mandatory reporting requirements for major GHG sources. Major GHG sources are generally defined as facilities that emit more than 25,000 metric tons of CO2e.

Third, the CARB was required to publish a list of discrete early action items to achieve the maximum technologically feasible and cost-effective reductions in GHG emissions. These early action measures are intended to be initiated in the 2007 to 2012 time frame. The CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of those early action measures, nine are considered discrete early action measures, as they are regulatory and became enforceable on January 1, 2010. The CARB estimates that the 44 measures are expected to result in reductions of at least 42 $MMTCO_2e$ by 2020, representing approximately 25 percent of the 2020 target.

Fourth, the CARB is required to adopt the Climate Change Scoping Plan (Scoping Plan) for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions to meet AB 32's GHG-reduction goals. The Scoping Plan "proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health." In general, the Scoping Plan's recommendations for reducing GHG emissions to 1990 levels by 2020 include a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, and Voluntary Early Actions and Reductions. The measures in the Scoping Plan are scheduled to be in place by 2012.

The Scoping Plan calls for an "ambitious but achievable" reduction in California's GHG emissions, cutting approximately 29 percent from business-as-usual emission levels projected for 2020, or about 15 percent from 2008 emission levels. On a per-capita basis, that means reducing annual emissions from 14 tons of carbon dioxide for every person in California down to about 10 tons per person by 2020. The year 2020 goal of AB 32 corresponds with the mid-term target established by Executive Order S-3-05, which aims to reduce California's fair share contribution of GHGs in 2050 to levels that will stabilize the climate.

The foundation of the Scoping Plan is the imposition of GHG emission caps on most sectors of the California economy, so-called "capped sectors." Within the capped sectors, reductions will be achieved through direct emission reduction measures (e.g., improved building efficiency standards and vehicle efficiency measures) as well as potential monetary and non-monetary incentives resulting from a cap-and-trade program. The Scoping Plan was approved by the CARB in December 2008 (CARB 2008). Currently, the recommended measures in the Scoping Plan are being developed into regulations. GHG emission reductions associated with these strategies are generally categorized into the following emission-reduction sectors, which are discussed in more detail, as follows.

Transportation Sector. The transportation sector is estimated to contribute 38 percent of California's total GHG emissions. As a result, emission reductions that target this sector are one of the key elements in the state's efforts of reducing GHG emissions. The state's multi-pronged approach to lower emissions from transportation focuses on working with Congress to allow California to set its own vehicle efficiency and mileage standards, to set lower levels of carbon in transportation fuels, to transition the state from gasoline and diesel to clean-burning alternative and renewable fuels, and to establish low-carbon fuel standards. Additional action items have been included to reduce emissions from vehicle refrigerants, to improve vehicle mileage with implementation of a tire-inflation program, and to reduce idling and auxiliary engine emissions (CARB 2008).

Electricity and Commercial/Residential Energy Sector. This sector is the next largest contributor and is estimated to contribute over 30 percent of the state's total GHG emissions. Increased energy efficiency and the promotion of renewable energy are considered essential components of the state's efforts of achieving AB 32 requirements for this sector. Reductions in emissions associated with this sector will be achieved, in part, by establishing more energy-efficient building and appliance standards, implementing traditional utility programs, and delivering new strategies and technologies through local governments, community organizations, and the private sector (CARB 2008).

As part of this effort, the California Energy Commission (CEC) has focused on increasing efficiency standards for both appliances and buildings. The most current California Energy Code (Title 24, Part 6), containing Building Energy Efficiency Standards, went into effect in January 2010. With implementation of Title 24 standards, further reductions of GHG emissions are anticipated (CARB 2008).

Industrial Sector. This sector includes refineries, cement plants, oil and gas production, food processors, and other large industrial sources. This sector contributes almost 20 percent of the state's total GHG emissions, although this sector is not projected to expand significantly in the future.

Other Sectors (Recycling and Waste, High Global Warming Potential (GWP), Gases, Agriculture, Forest). The above-referenced sectors contribute the remaining 32 percent of the state's total GHG emissions. The evaluation of potential reductions of GHG emissions that can be achieved from these sectors is ongoing (CARB 2008).

Emission reductions in California would not be able to stabilize the concentration of GHGs in the atmosphere on a global scale. However, California's actions set an example and drive progress towards an overall reduction in GHGs. If other countries were to follow California's emission reduction targets, this could avoid medium or higher ranges of global temperature increases, thereby avoiding the most severe consequences of climate change.

It should be noted that AB 32 did not amend CEQA or establish regulatory standards to be applied to new development or environmental review of projects within the State. Accordingly, the California Legislature adopted SB 97 (discussed below).

Senate Bill 97

Senate Bill 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR) to develop and propose "guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required [by CEQA], including but not limited to, effects associated with transportation or energy consumption." (Pub. Res. Code § 21083.05(a)).

The OPR transmitted proposed SB 97 CEQA Guidelines Amendments to the California Resources Agency in April 2009. In July 2009, the California Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code section 21083.05. In December 2009, the California Resources Agency delivered its rulemaking package to the Office of Administrative Law for their review pursuant to the Administrative Procedures Act. In February 2010, the Office of Administrative Law filed the Amendments with the Secretary of State. These amendments became effective on March 18, 2010.

Summary: Amendments To The CEQA Guidelines

Following is a summary of the amendments to the CEQA Guidelines adopted in March 2010, which set forth a basic framework of analysis for assessing a project's contribution to GHG levels. They do not, however, dictate a specific metric that lead agencies should use to determine whether a project's incremental GHG emissions are cumulatively considerable in light of past, present and reasonably foreseeable probable future projects. Rather, it is the regional air quality districts and/or local lead agencies that are left to develop thresholds of significance to be applied within their respective areas of jurisdiction.

An EIR or other environmental document must analyze the incremental contribution of a project to GHG levels and determine whether those emissions are cumulatively considerable. (CEQA Guidelines Section 15064.4; Public Resources Code Section 21083, 21083.05; Final Statement of Reasons for Regulatory Action (Final Statement), p.55 (Dec. 2009).) In conducting this analysis, the following principles should be considered.

- In defining the scope of other projects necessary to carry out a cumulative impact analysis, an agency may use a summary of projections adopted in a local, regional, or statewide plan, or some related planning document, such as a general plan, regional transportation plan, or a plan for the reduction of greenhouse gases. (CEQA Guidelines Section 15130(b)(1)(B).)

- An analysis of GHG emissions may rely on either a qualitative or quantitative analysis. (CEQA Guidelines Section 15064(a)(1) and (2).) The California Resources Agency has, however, explained that emissions should be quantified where possible, and refers to some existing models that may prove adequate in carrying out such an analysis. (*See Final Statement*, pp.20-21.)

- The CEQA Guidelines make general suggestions regarding a method of assessing the significance of an impact, such as reviewing:

- The extent to which a project increases or decreases GHG emissions when compared to the existing environment. (Guidelines Section 15064.4(b).) "All project components, including construction and operation, equipment and energy use, and development phases must be considered." (Final Statement, p. 24.)
- Whether a project exceeds a threshold of significance (with the lead agency retaining the discretion to choose a threshold). (CEQA Guidelines Section 15065.5(h).)
- The extent to which a project complies with regulations adopted to implement a statewide, regional or local plan for the reduction or mitigation of GHG emissions, such as those under SB 375 and local climate action plans. (CEQA Guidelines Sections 15064.4(b), 15183.5(b)(1).)

- Provide that an agency must discuss the extent to which a project is inconsistent with general plans, specific plans, and regional plans, the latter of which may include plans for the reduction of GHG emissions, regional transportation plans or other, more wide-scale planning documents. (CEQA Guidelines Section 15125(d).) CEQA does not define what it means to "comply" with a plan, in the context of determining consistency, though the California Resources Agency has suggested compliance means the plan actually addresses the emissions that would result from the project, or the project furthers the objectives and policies of the plan and does not frustrate their attainment.
- Allow agencies, when adopting thresholds of significance, to consider those previously adopted or recommended by other agencies, or recommended by experts, provided that substantial evidence informs such thresholds. (CEQA Guidelines Section 15064.7(c).)
- Provide options for mitigation measures, including: (1) those incorporated into an existing plan or program, ordinance or regulation for the reduction of GHG emissions; (2) implementation of project features, design or other measures to reduce GHG emissions; (3) off-site measures, including offsets that are not otherwise required to mitigate the project's GHG emissions, which presumably will form part of an AB32 cap-and-trade program; and (4) measures that sequester GHGs. (CEQA Guidelines Section 15126.4.(c).)

Attorney General CEQA Guidance

In March 2009, the Attorney General's Office issued an eight-page document entitled Climate Change, the California Environmental Quality Act, and General Plan Updates: Straightforward Answers to Some Frequently Asked Questions ("FAQs") to provide guidance on preparing CEQA documents. In essence, the document informs lead agencies and prospective project developers that: lead agencies must calculate GHG emissions and describe climate change impacts in EIRs; technical guidance documents and tools to calculate GHG emissions are

available; lead agencies should consider lower-carbon alternatives; and lead agencies' mitigation must be fully enforceable. The Attorney General's Office also published a document entitled Addressing Climate Change at the Project Level, which included a non-exhaustive list of recommended mitigation measures to reduce GHG emissions. These measures relate to such areas as energy efficiency, renewable energy, energy storage, water conservation and efficiency, solid waste measures, land use measures, transportation and motor vehicles, agriculture and forestry, and offsite measures.

Senate Bill 375

In September 2008, the California legislature adopted SB 375, legislation which: (1) streamlines CEQA requirements for certain projects that meet goals for reducing GHG emissions, and (2) requires the regional governing bodies in each of the state's major metropolitan areas to adopt, as part of their regional transportation plan, "sustainable community strategies" (SCS) that will meet the region's target for reducing GHG emissions. In addition, SB 375 creates incentives for creating walkable, sustainable, transit-oriented communities, including funding conditions. SB 375 attempts to tie together climate change, regional planning, transportation funding, and affordable housing. The purpose of the SCS plans is to reduce GHG emissions associated with global climate change by improving the efficiency of land use and transportation patterns.

SB 375 also directs the CARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. The CARB will determine the level of emissions produced by cars and light trucks, including sport utility vehicles, in each of California's 17 metropolitan planning areas. Emissions-reduction goals for 2020 and 2035 would be assigned to each area. The CARB appointed a Regional Targets Advisory Committee in January 2009 to provide recommendations on factors to consider and methodologies to use in this target setting process; the CARB proposed draft targets in June 2010, and adopted final targets in September 2010.

Local governments would then devise strategies for housing development, road building and other land uses to shorten travel distances, reduce driving and meet the new targets. If regions develop these integrated land use, housing, and transportation plans, residential projects that conform to the SCS (and therefore contribute to GHG reduction) may have the opportunity to take advantage of a more streamlined environmental review process.

Executive Order S-13-08

Executive Order S-13-08 indicates that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its

population and to its natural resources." Pursuant to the requirements in the order, in December 2009, the California Resources Agency released its 2009 California Climate Adaptation Strategy. The Strategy is the "…first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Guidance from Professional Organizations

The California Air Pollution Control Officers Association (CAPCOA) has authored a white paper entitled *CEQA and Climate Change*, which sets forth alternative methodologies for evaluating project impacts on GHG levels, and for determining whether a project's contribution to global climate change is cumulatively considerable.

The CAPCOA white paper identifies three programmatic approaches to establishing GHG significance thresholds, and also discusses the benefits and problems associated with each approach. Each approach has inherent advantages and disadvantages. The basic approaches are:

- GHG emissions threshold set at zero; or
- GHG threshold set at a non-zero level based on achieving the objectives of AB 32 and Executive Order S-3-05; or
- GHG threshold set at a non-zero level with a tiered approach

At the end of the white paper, CAPCOA provides a list of potential mitigation measures and discusses each in terms of emissions reduction effectiveness, cost effectiveness, and technical and logistical feasibility.

Regional/San Benito County

To date, neither the MBUAPCD nor San Benito County has formally adopted regulations, policies, or mitigation plans that explicitly address climate change.

MBUAPCD

The MBUAPCD is currently in the process of developing recommendations for thresholds of significance for GHGs. The draft recommendations address thresholds for individual land use projects, land use plans, and stationary sources. To date, the land use development related thresholds being considered have focused on GHG efficiency metrics. This approach assesses the GHG efficiency of a project on a per capita basis (residential-only projects) or on a service

population (SP) basis, which reflects the total number of jobs and residents provided by a project, such that the project would ensure consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020). The efficiency thresholds that have been discussed to date are 4.6 metric tons CO2e for individual land use projects and 6.6 metric tons CO2e for land use plan projects. The MBUAPCD expects to officially adopt GHG thresholds in early 2012.

San Benito County General Plan

San Benito County is currently updating its General Plan. The General Plan update is expected to include a Climate Change element. However, it is not anticipated that the General Plan update will be adopted prior to the time the County Board of Supervisors considers whether or not to approve the proposed project.

The San Benito County General Plan Open Space and Conservation Element contains the following policy with regard to air quality, the implementation of which would reduce the generation of criteria air pollutant emissions as well as GHG emissions:

> **Policy 10: Air Quality.** The County recognizes air as a natural resource and will strive to maintain air quality through proper land use planning. It shall be the County's policy to utilize land use and transportation controls for the protection and enhancement of air quality. Finally, it will be County's policy to review public and private development proposals in light of possible recreational and open space potential.

Actions:

1. The County, by resolution, will establish a policy of urban concentration for the protection of air quality. The resolution should specifically discourage the development of commercial and residential areas outside of urban centers, other than those defined in the Land Use Element, in order to reduce the impacts of air pollution caused by commuting and shopping.

2. Require convenient pedestrian and bicycle access to parks and community facilities and the development of on-site private recreation to serve the needs of unincorporated clusters of population.

3. Develop land use programs to reduce vehicle miles and trips, thereby reducing traffic congestion and protecting and enhancing air quality.

4. Allow clustering and encourage conservation easements to direct population growth from natural resources to areas where services are provided.

3.5.3 STANDARDS OF SIGNIFICANCE

Global Climate Change and CEQA

There are several unique challenges to analyzing a project's impact on the global climate under CEQA, largely because of the "global" nature of climate change. Typical CEQA analyses address local actions that have local — or, at most, regional — impacts, whereas global climate change presents the considerable challenge of analyzing the relationship between local and global activities and the resulting potential, if any, for local or global environmental impacts. Most environmental analyses examine the "project-specific" impacts that a particular project is likely to generate.

With regard to global climate change, however, it is generally accepted that the magnitude of global warming effects is so significant and the contribution of an individual project to global warming is so small that direct significant adverse impacts (albeit not necessarily cumulative significant adverse impacts) would be highly unlikely. The issue of global climate change is also fundamentally different from any other areas of air quality impact analyses, which are all linked to some region or area in which the impact is significant. Instead, a global climate change analysis must be conducted on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions. For this reason, the CEQA analysis of any one project's impact on climate change is inherently an evaluation of its cumulative impact. If a project's contribution of GHG emissions is determined to be cumulatively considerable, the project would have a cumulatively significant impact on climate change.

In the usual context, where air quality is linked to a particular location or area, it is appropriate to consider the creation of new emissions in that specific area to be an environmental impact whether or not the emissions are truly "new" emissions to the overall globe. In fact, the approval of a new developmental plan or project does not necessarily create new automobile drivers — the primary source of land use projects' emissions. Rather, new land use projects merely redistribute existing mobile emissions. Accordingly, the use of models that measure overall emissions increases without accounting for existing emissions will substantially overstate the impact of the development project on global warming. This makes an accurate analysis of GHG emissions substantially different from other air quality impacts, where the "addition" of redistributed emissions to a new locale can make a substantial difference to overall air quality.

Standards of Significance

As discussed above, the CEQA Guidelines Appendix G – Environmental Checklist Form includes two questions pertaining to GHG emissions. These are being used by many lead agencies as guidance for determining the potential significance of project impacts; this guidance is used in this EIR for the same purpose. The impacts related to GHG emissions resulting from the implementation of the proposed project would be considered significant if they would exceed the following significance criteria, in accordance with Appendix G of the *State CEQA Guidelines:*

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

At this time, no state agency, the MBUAPCD, or San Benito County has adopted numeric thresholds that may be used to determine whether the proposed project's directly or indirectly generated GHG emissions could have a significant impact on the environment. The amendments to the State CEQA Guidelines reaffirm that the lead agency has the discretion to determine how to evaluate a project's significance under CEQA. The State CEQA Guidelines includes a new Section 15064.4, which states that, when making a determination of the significance of GHG emissions, a lead agency shall have discretion to determine whether to use a model or methodology to quantify GHG emissions and/or rely on a qualitative analysis or performance-based standards. In the absence of applicable numeric thresholds or a local or regional GHG reduction plan, many local jurisdictions have used consistency with AB 32 for purposes of evaluating GHG impacts given that in such circumstances AB 32 is the only applicable GHG reduction plan. This is the threshold used to evaluate the project's impacts for purposes of this Draft EIR.

Methodology

Quantification of the Project's Construction Phase GHG Emissions

As recommended, this Draft EIR quantifies construction-related GHG emissions. These would be generated during site preparation and construction of the project. Typical sources of emissions include construction equipment and vehicle trips to transport workers and construction materials to and from the project site. As described in the Air Quality Study, URBEMIS 2007 air quality modeling was used to estimate construction phase criteria pollutant and GHG emissions. Default values for the construction phase were used.

Quantification of the Project's Operational GHG Emissions

As recommended, this Draft EIR also quantifies operation-related GHG emissions. GHG emissions from the operations of development projects are most typically associated with transportation and energy use/consumption. Direct GHG emissions sources include those from a specific operation or process on the site; e.g., fuel combustion emissions from a boiler. Indirect GHG emissions would include emissions resulting from project-related energy consumption; e.g., electricity consumed by the project's residential units; electricity required to produce and transport water used by the project; electricity required to pump and treat wastewater; and fugitive hydrofluorocarbons emissions from the normal operation of refrigeration systems and the heating and utilities systems.

URBEMIS results were used to estimate GHG emissions from mobile sources (transportation) and from area sources (most typically the on-site combustion of natural gas). The CARB's *Local Government Operations Protocol* (LGOP) Version 1.0 was used to quantify GHG emissions resulting from off-site electricity generation needed to meet project demand (CARB 2010).

Similar to the *California Climate Action Registry General Reporting Protocol*, the LGOP contains emissions factors for use in quantifying indirect CO_2, CH_4, and N_2O emissions resulting from electricity generation. These factors were supplemented with information obtained from the electricity provider, Pacific Gas and Electric, and through information from other sources including the Energy Consumption Demand Management System (ECDMS) data for San Benito County (*http://ecdms.energy.ca.gov/elecbycounty.asp#results*) and U.S. Census Data for San Benito County (*http://quickfacts.census.gov/qfd/states/06/06069.html*).

3.5.4 CUMULATIVE IMPACTS AND MITIGATION MEASURES

Greenhouse Gas Emissions

Impact CC-1: Project-generated GHG emissions could have a significant impact on the environment and could conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. However, due to the implementation of relevant regulations and the design features incorporated into the project, this impact is **less than significant.**

As set forth in CEQA Guidelines Section 15064.4, the determination of the significance of GHG emissions calls for careful judgment by the lead agency consistent with the provisions in CEQA Guidelines Section 15064. A lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a

project. The following discussion focuses on the proposed project's contribution to global climate change by quantifying GHG emissions and qualitatively discussing the GHG emission reduction measures included in the proposed project that promote its consistency with and further the state's goals and strategies for reducing GHG emissions as well as relevant regulations that would also help to ensure a reduction in GHG emissions.

Quantification of Construction Phase GHG Emissions

The project would emit GHGs from upstream emission sources, direct sources (combustion of fuel in construction equipment), and individual sources (combustion of fuel in construction worker vehicles).

An upstream emission source (also known as life cycle emissions) refers to emissions that are generated during the manufacture of products to be used for construction of the project. Upstream emission sources for the project include, without limitation, the following: emissions from the manufacture of cement and steel; and/or emissions from the transportation of building materials. The upstream emissions were not estimated for purposes of this evaluation because, after due consideration, it was determined that they are not within the control of the project and to do so would be speculative at this time. The CAPCOA white paper on CEQA and Climate Change supports this conclusion by stating, "The full life-cycle of GHG [greenhouse gas] emissions from construction activities is not accounted for…and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level." Therefore, pursuant to CEQA Guidelines Sections 15144 and 15145, upstream/life cycle emissions are speculative and no further discussion in this Draft EIR is necessary.

GHG emissions would be generated from other sources during construction of the proposed project. Typical sources of emissions include construction equipment (e.g., bulldozers, forklifts, backhoes, and water trucks) and vehicle trips to transport workers and materials to and from the project site.

As described in the Air Quality Study, URBEMIS air quality modeling was used to estimate construction phase criteria pollutants and GHG emissions. For the purpose of estimating GHG emissions, the URBEMIS combined annual emissions report was utilized. Default values for the project's construction phase were used. The total estimated volume of construction GHG emissions is approximately 577.3 tons or 523.7 metric tons. This analysis did not assume any mitigation measures and therefore reflects the amount of GHG emissions that would result in an unmitigated scenario. Emissions generated during the various construction phases would vary, depending on the level and specific type of activity. The highest annual emissions would likely occur during the initial year of construction when multiple construction phases (i.e., demolition, grading, and building construction) would occur within a single one-year period.

Emissions of nitrous oxide and methane during the construction phase would be negligible because diesel-fueled construction equipment emit 99 to 99.9 percent of GHG emissions in the form of CO_2 (CCAR 2009 and CEC 2002) on a per CO_2e basis. Less than one percent of the GHG emissions, on a CO_2e basis, are in the form of methane and nitrous oxide in comparison and therefore were not estimated.

Quantification of Operational GHG Emissions

Operational or long-term emissions that would occur over the life of the project include emissions from the following sources:

Mobile:

- Motor vehicles and trucks associated with the new homes

Area:

- Combustion of natural gas in the residential units
- Hearth use associated with the residential units
- Combustion of gas associated with landscape maintenance equipment

Electricity Demand:

- Off-site electricity generation to provide electricity to the project
- Electricity required to transport and treat the water that would be used for the project
- Electricity to pump and treat wastewater generated by the project

Solid Waste:

- Solid waste generated by the project taken to a landfill and decomposing

Fugitive Emissions from Heating/Cooling Systems:

- Fugitive hydroflurocarbons emissions from normal operation of refrigeration systems and the heating and ventilation systems.

GHG Emissions from Mobile (Transportation) and Area Sources

The URBEMIS2007 air quality model was run in order to estimate annual GHG emissions for operation of the project site with 220 single-family residential units (refer to Appendix G). The trip generation rate of 9.57 trips per day per dwelling unit that was used to estimate daily traffic

volumes and resulting emissions from mobile sources is based on the conservative assumption that all residential units would be detached single-family units. The Specific Plan provides flexibility in the types of residential units that may be constructed; higher-density residential development, which typically has lower trip generation rates, is permitted so long as the maximum unit count does not exceed 220 dwelling units. Hence, the trip generation rate used and the resulting mobile source GHG emissions may be somewhat conservative.

None of the emission mitigation options available in the URBEMIS2007 model were selected for inclusion in the model run. Therefore, the results show the conservative, *unmitigated* GHG emissions for both mobile and area sources. Mobile source emissions were estimated at approximately 3,627 tons of CO_2 per year. Area source emissions were estimated at approximately 823 tons of CO_2 per year. The URBEMIS model does not provide estimates of other GHGs associated with combustion, namely CH_4 and N_2O. Therefore, in order to account for emissions of these compounds, the following adjustments were made to the URBEMIS emissions calculations:

- **Area sources (natural gas, hearths, gasoline-fueled landscaping equipment):** The CO2 emissions from natural gas consumption and of the landscaping equipment were adjusted based on emission factors for CO2, CH4 and N2O from URBEMIS2007 and the California Climate Action Registry (California Climate Action Registry 2009).

- **Motor Vehicles:** The CO2 emissions associated with project-generated trips were multiplied by a factor based on the assumption that CO2 represents 95 percent of the CO2e emissions associated with passenger vehicles, which account for most of the project-related trips. This assumption was based on data provided by the U.S. EPA (EPA 2005).

  In addition, CO_2 emissions were converted to CO_2e estimates. Based on these conversions, the mobile source GHG emissions are estimated at 3,464 metric tons of CO_2e per year and the area source GHG emissions are estimated at 748 metric tons of CO_2e per year.

GHG Emissions from Electricity Generation

Electricity Used By The Project's Residential Units. The California Energy Consumption Data Management System (ECDMS) includes energy consumption data for individual counties. In 2008, ECDMS data shows that residential development in San Benito County consumed approximately 120,000,000 kilowatt hours (kWh) of energy. U.S. Census data for 2008 indicate that there were approximately 17,827 housing units in the County. This data can be used to estimate that a single dwelling unit in the County consumed an average of approximately 6,732 kWh of energy in 2008. Using this factor, the 220 proposed residential units would create a total

average demand for approximately 1,481,040 KWh per year of electricity or approximately 1,481 megawatt hours (MWh) per year for on-site use.

Electricity Used to Transport and Treat Water and to Pump And Treat Wastewater. Energy used in water pumping and wastewater treatment is a notable source of GHG emissions. Please refer to Section 3.15, Wet and Dry Utilities and Energy, for calculations of project water demand and wastewater generation. The Local Government Operations Protocol (LGOP) energy use factor for off-site water pumping is 1,450 kilowatt hours (kWh) per 1,000,000 gallons of water consumed. Water demand for the project is estimated at 71,550 gallons per day. This equates to approximately 26.1 million gallons of water per year and the associated energy use is estimated at approximately, 37,845 kWh per year, or approximately 38 MWh per year.

Assuming a residential water consumption rate of 85 percent (with approximately 15 percent of water that is ultimately consumed on-site for exterior use, which never enters the waste stream), the proposed project is expected to generate approximately 60,818 gallons per day of wastewater. This equates to 22.2 million gallons per year. The LGOP energy demand factor for wastewater pumping and treatment is about 2,500 kWh per 1 million gallons of wastewater treated. Electricity demand from wastewater pumping and treatment would, therefore, be approximately 55,500 kWh per year or approximately 56 MWh per year.

Table 13, Estimated Annual Electricity Demand, summarizes the estimated annual average electricity demand of the proposed project based on on-site electricity use, water supply conveyance and treatment, and wastewater pumping and treatment. The demand shown is considered conservative and does not reflect any energy conservation or other measures that might be employed as part of the project to reduce electricity demand.

Table 13 Estimated Annual Electricity Demand

Sources of Demand	Demand (MWh)/Year
On-Site Electricity Use	1,481
Water Supply Transport and Treatment	38
Wastewater Pumping and Treatment	56
Total	**1,575**

Source: EMC Planning Group 2010

Table 14, GHG Emissions from Electricity Generation, summarize estimated GHG emissions resulting from the proposed project's on-site and off-site demand for electricity. As noted above,

the estimate is considered conservative since it does not reflect any mitigation measures that might be employed as part of the project to reduce electricity demand.

Table 14 GHG Emissions from Electricity Generation

Projected Electricity Demand from Future Development (MWh)	GHG Type	GHG Emissions Factor (lbs/MWh)	Global Warming Potential	CO2e(metric tons/yr)2
1,575	CO_2	559.0	1	399
1,575	CH_4	0.029	21	1
1,575	N_20	0.011	310	2
Total				**402**

Source: EMC Planning Group 2010

Notes:

1. CO_2 factor from PG&E 2011; CH_4 and N_2O factors from Local Government Operations Protocol, 2010.
2. CO_2 Equivalent is calculated as (electricity use) x (emissions factor) x (warming potential) / (2,204.62 lb/metric ton). Figures shown are rounded to the nearest metric ton.

GHG Emissions from Solid Waste Disposal

As described in Section 3.15, Wet and Dry Utilities and Energy, the proposed project is anticipated to generate approximately 326 tons per year of solid waste. The primary sources of GHGs from solid waste are in the form of CO_2 and CH_4 generated as a result of the decomposition of the waste in landfills. Such decomposition produces landfill gas that is typically composed of approximately 50 percent CO_2 and 50 percent CH_4.

Solid waste from the proposed project would be delivered to the nearby John Smith Road landfill for disposal. The John Smith Road landfill employs a landfill gas collection system. Captured gas is burned in a flare.

In the absence of a landfill gas collection and disposal system, up to 90 percent of the landfill gas produced in a landfill escapes to the atmosphere, thereby exacerbating global warming (U.S. EPA 2008). Combustion of the gas by flaring or alternative use (i.e., in an engine to produce electricity) "destroys" up to 99 percent or more of the CH_4 contained in the landfill gas. Combustion also results in release of CO_2, but the volume of CO_2 released is no greater than would have been released to the atmosphere through the natural decomposition of the waste. Consequently, it is considered to be a biogenic source of emissions and is not included in the

GHG emissions inventory. Through combustion of landfill gas, the net volume of GHGs released to the atmosphere is substantially reduced. Consequently, GHGs from solid waste generated by the proposed project should not add measurably to the net project GHG emissions inventory.

GHG Emissions From Fugitive Hydrocarbons

Fugitive hydroflurocarbons emissions, which are potent GHGs, are a notable GHG emissions source that can be generated from normal operation of refrigeration systems and heating and ventilation systems (CARB 2008). However, hydroflurocarbon emission sources would be nominal for this type of residential project and are not typically calculated for residential projects since there is no established methodology for calculating the emissions from these sources. Therefore, no such calculations were made for purposes of this Draft EIR.

Table 14, Total Unmitigated Operational GHG Emissions, shows the sum of unmitigated direct and indirect emissions.

Table 15 Total Unmitigated GHG Operational Emissions (metric tons/year CO_2e)

GHG Emissions Source	GHG Emissions Volume
Mobile Sources	3,464
Area Source	748
Electricity Demand	402
Solid Waste	-------
Fugitive Emissions from Heating/Cooling Systems	-------
Total	**4,614**

Source: Illingworth and Rodkin, 2008, EMC Planning Group 2010

Existing Project Site Baseline GHG Emissions

GHG emissions from current land use activities within a project site or associated with those activities can be an important factor in the overall emissions balance for a project. For example, undeveloped land can provide value as a source of carbon sequestration. Soil and plants can act as a carbon "sink" by absorbing (sequestering) CO_2 from the atmosphere and converting it to forms that, under most conditions, do not exacerbate global warming.

The project site is undeveloped land that is used to cultivate barley as well as periodic grazing of cattle. Dry farmed (non-irrigated) land, such as the project site, generally does not provide substantial potential carbon sequestration because crops are turned over in a relatively short time period, which results in the re-release of sequestered carbon back into the soil and atmosphere, and the vegetative massing is much less than that of trees. Consequently, conversion of the project site from dry farmland to the proposed suburban use would not result in a substantial loss of carbon sequestration capacity.

The notable GHG emission-generating activities associated with the existing agricultural use of the project site are periodic use of agricultural machinery and the use of haul trucks for transporting dry farmed crops. Since these activities are periodic and minimal in frequency, it is assumed that GHG emissions associated with the current agricultural use are negligible. Hence, the proposed project could not be characterized as providing significant benefits by eliminating existing sources of significant GHG emissions. Given that changes in the existing GHG baseline conditions for the project site would not result in decreases in GHG emissions, no adjustments have been made to the emissions estimate for the proposed project reported above.

Consistency with Validated GHG Emissions Reduction Strategies

Broadly accepted guidance on evaluating climate change impacts of new development and on GHG mitigation strategies and measures has been developed and continues to be refined in response to AB 32. Guidance provided by the California Attorney General's Office and the CAPCOA are among the most widely utilized sources. These sources are utilized in this Draft EIR as a basis to identify a broad range of GHG emissions reduction measures that are applicable to the proposed project and to determine the extent to which the project has been designed to incorporate such measures.

As noted above, the AB 32 Scoping Plan also includes a range of GHG reduction measures that may be applicable to local land use projects. These generally address such measures as energy efficiency in vehicles, water conservation (and reduced energy demand for water pumping and irrigation), green building measures, etc. However, the Scoping Plan measures are not specifically designed for project-level application, and therefore are not directly applicable to the project. However, as fuel, building and vehicle standards and regulations are adopted by the state in furtherance of the Scoping Plan measures, homes constructed on the project site and vehicles operated by the residents of the development would result in lower emissions compared to business as usual emissions.

The CEQA Guidelines provide that a key question is whether a project complies with a plan for the reduction of GHGs that contains requirements that would result in the reduction of such

emissions to a less-than-significant level. There is no such applicable local, regional or state plan at this time. Therefore, the project will be evaluated for consistency with measures and guidance provided by the Attorney General's Office and the CAPCOA white paper.

California Attorney General's Office

The California Attorney General has issued a range of opinions and documents that have reinforced CEQA as an appropriate tool for assessing climate change impacts of new development and for supporting implementation of AB 32. The California Attorney General's *Addressing Climate Change at the Project Level*, released in 2008 and updated in 2010 is one key source of information. This document lists a range of GHG reduction measures to be considered for inclusion in development projects to reduce GHG emissions consistent with the intent of AB 32. As noted in the document, each measure should not be considered in isolation, but as part of a larger set of measures, that together, would help reduce GHG emissions and the effects of global warming.

CAPCOA

An additional comprehensive source of GHG reduction measures for land use projects is CAPCOA's white paper, CEQA and Climate Change – Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the Environmental Quality Act, published in 2008. Appendix B of the CAPCOA document contains a compendium of GHG reduction measures, along with data about reduction potential, cost, ease of implementation, etc.

Emission reduction measure guidance in connection with this project was developed by the two sources noted above in the context of AB 32 and the important role that local land use development projects and local lead agencies have in implementing AB 32. The "menu" of GHG reduction options developed by each source can be used by project developers in the design of proposed projects. The information is also useful to lead agencies for identifying GHG reduction measures that apply to a given project type and to determine the extent to which a project applicant has incorporated applicable GHG reduction measures. In the absence of a County or MBUAPCD plan for reducing GHG emissions, the extent to which a project includes GHG reduction measures designed to facilitate compliance with AB 32, the applicable GHG reduction plan, allows a lead agency to qualitatively determine if a project would conflict with or impede AB 32.

GHG Emission Reduction Features Included in the Proposed Project

As noted above, in the absence of a local, regional or state plan, this analysis will focus on the project's consistency with measures and guidance provided by the Attorney General's Office and the CAPCOA's white paper.

The Fairview Corners Residential Specific Plan includes a broad range of policies and implementation measures to reduce GHG emissions. Further, the intentionally designed land use relationship of the proposed project to the adjoining Gavilan College San Benito Campus project provides GHG reduction benefits that would not accrue in the absence of such intentional design.

As discussed above, the extent to which the proposed project incorporates GHG reduction measures may be qualitatively considered as a measure of its consistency with AB 32. If the proposed project is found to be consistent with AB 32, it can also be assumed that the project would not have a cumulatively considerable cumulative impact on the environment.

Table 16, GHG Reduction Measures, summarizes the GHG reduction measures recommended as part of a menu of options set forth in the two sources noted above and the GHG reduction measures incorporated into the project. Specifically, the left hand column of Table 16 includes a synthesis of GHG emission reduction measures recommended by the California Attorney General and CAPCOA, as described above. Only GHG reduction measures that are within the control of the applicant are listed. The second column of Table 16 includes GHG reduction measures included in the Specific Plan in the form of policies and implementation measures. It also includes integrated land use design features that serve to reduce vehicle miles traveled and by extension, GHG emissions, resulting from coordinated planning of the proposed project and the San Benito Campus project. As stated on page 169 of the Gavilan EIR:

> The college campus project includes on-site retail and adjacent residential. These adjacent uses are intended to reduce vehicle trips through internalization and reduction of trips to use college recreational, retail, library, and cultural facilities. The residential project may utilize the campus retail, as well as the open space, recreational, and cultural facilities on the campus, all of which will serve to reduce vehicle trips.

As can be seen from Table 16, GHG Reduction Measures, the proposed project includes a comprehensive range of GHG reduction measures that are consistent with guidance provided by the California Attorney General's Office and CAPCOA for the purpose of facilitating consistency of new land use projects with AB 32. Therefore, implementation of the proposed project is not anticipated to conflict with or impede the state's objectives of reducing GHG emissions as expressed in AB 32.

Table 16 GHG Measures

Representative GHG Reduction Measures[1]	Measures Included in Project[2]	Estimated Effectiveness of Measures
Transportation/Mobile Source Related GHG Reduction Measures		
Non-motorized transportation (bike and pedestrian) access and features	Policy LU-7.1 and implementation measure LU-7.1.1 require integrated open space, parks, and trails. Policies CP 5.1 and 5.2 and their accompanying implementation measures, and Policy CD-2.1 and its accompanying implementation measures require integrated bicycle and pedestrian facilities throughout the project site including Class I and II bicycle lanes, signal light sensors, separated routes, sidewalk connectivity, traffic calming, handicap access, cul-de-sac pedestrian connections, connections to the Gavilan San Benito Campus, etc. Implementation measure LU-11.2.2 requires that multi-family developments provide secure bicycle parking.	Up to 2.5% reduction in vehicle miles traveled for bicycle-related measures. Between 3.0 and 21.3% reduction in vehicle miles traveled for improved design elements that enhance walkability and connectivity.
Traffic calming measures to benefit non-motorized transport modes	Implementation measures CD-2.2.2 and CD-2.2.3 require that streets within the project site be designed to limit speeds to 25 mph and that traffic calming features be incorporated to slow traffic. Policy CP-4.1 and its associated implementation measures CP-4.1.1 through CP-4.1.4 all directly require that traffic calming measures be incorporated into the circulation network.	Between 0.25 and 1.0% reduction in vehicle miles traveled for traffic calming measures.

Representative GHG Reduction Measures[1]	Measures Included in Project[2]	Estimated Effectiveness of Measures
Transit service facilities/development density sufficient to support public transit	Implementation measures CP-6.1.1 and CP-6.1.2 require coordination with applicable agencies to make transit service accessible to the project site. Reservation of one or more bus stops in coordination with needs generated by the Gavilan San Benito Campus project is required. The proposed project and the Gavilan San Benito Campus are likely to provide sufficient transit user density to warrant extending one or more transit routes to the area. In addition to a maximum of 220 single-family homes, it is projected that 55 secondary units, if constructed on owner-occupied lots, would increase potential transit user density within the project site.	Between 0.5 and 24.6% reduction in vehicle miles traveled. Transit stops should be located within a 5-10 minute walking distance (approximately ¼ mile) for bus service or within a 20 minute walk (approximately ½ mile) for a rail station. Transit should be fast, frequent, and reliable. The surrounding neighborhood should be designed for walking and cycling.
Affordable housing incorporated	Policy LU-5.1 and its associated implementation measures require that an affordable housing program be developed and implemented. If affordable housing requirements are entirely or largely met within the project site, the purpose of the reduction measure will be met.	Between 0.04 and 1.2% reduction in vehicle miles traveled for the incorporation of affordable housing.
Telecommuting facilities	Implementation measure RM-8.2.1.11 requires that all dwelling units be wired to support/promote telecommuting.	Between 0.07 and 5.50% reduction in commuting vehicle miles traveled.
Land Use/Project Design		
Mix of uses within ¼ mile	Project residential uses would be located within ¼ mile of local serving retail commercial uses (if approved retail uses within the adjacent Gavilan San Benito Campus site are constructed); open	Between 9 and 30% reduction in vehicle miles traveled from mixed uses within ¼ mile.

Representative GHG Reduction Measures[1]	Measures Included in Project[2]	Estimated Effectiveness of Measures
	space, parks, and trails (both within the project site and the adjacent Gavilan San Benito Campus site), and educational facilities – the Gavilan San Benito Campus.	
Recharging facilities for cars, lawnmowers, other electric equipment	Implementation measure RM-8.2.14 requires that all garages/carports include a 240 volt, 40-amp circuit suitable for electric car charging. Implementation measure LU-11.2.1 requires electric car charging receptacles within reach of carport or garage parking spaces.	Potentially between 0.4 and 20.3 percent reduction in vehicle GHG emissions. Actual reduction would depend on end-users' purchase of hybrid-electric or all-electric vehicles.
Energy Efficiency and Renewable Energy		
Green Building Code/LEED certification	Development of projects consistent with green building codes and/or LEED certification requirements is deemed to improve project sustainability and would reduce energy demand. As set forth in Appendix D of the Specific Plan, the Specific Plan includes 20 actions that meet LEED Neighborhood Design or LEED for Homes prerequisites or credit requirements, which may be included in the proposed project. Effective January 1, 2011, qualifying new developments in San Benito County, which could include development within the project site, may also be subject to requirements of CALGreen, the state green building code.	Potential for substantial reductions in GHG emissions from building energy usage. Actual reduction would depend on the extent to which the buildings would exceed the Title 24 energy standards.
Renewable energy	Policy RM-8.2 and implementation measures RM-8.2.1, RM-8.2.2, RM-8.2.3, RM-8.2.5, RM-8.2.6, RM-8.2.7, RM-8.2.8, RM-8.2.9, RM-8.2.10, and RM-8.2.15 promote use of renewable energy by requiring lots to be oriented to maximize solar exposure and by	Potential for substantial reductions in GHG emissions from building energy usage. Actual reduction would depend

Representative GHG Reduction Measures[1]	Measures Included in Project[2]	Estimated Effectiveness of Measures
	requiring that a minimum of one-third of all dwelling units include solar panels. The option of wiring all remaining homes for solar panels must be offered to future homebuyers.	on end-users' purchase of solar panels.
Solar hot water heaters	Implementation measures RM-8.2.3 requires solar water heaters or tankless water heaters are available for one third of the residential units and included as an option on all dwelling units.	Reductions in GHG emissions from natural gas-fired water heaters.
Passive solar heating/cooling	Implementation measure RM-8.2.1 requires that homes be designed to facilitate passive solar heating. Implementation measures RM-8.2.5, RM-8.2.6, RM-8.2.7, RM-8.2.8, RM-8.2.9, and RM-8.2.10 facilitate passive solar cooling and heating. RM-8.2.13 requires the installation of heating, ventilation, and air conditioning duct seals that eliminate/substantially reduce leakage.	Potential for substantial reductions in GHG emissions from building energy usage. Actual reduction would depend on the extent to which the buildings would exceed the Title 24 energy standards.
Cool roofs	Implementation measure RM-8.2.1 requires that homes be designed to include cool roofs.	Potential for substantial reductions in GHG emissions from building energy usage. Actual reduction would depend on the extent to which the buildings would exceed the Title 24 energy standards.

Representative GHG Reduction Measures[1]	Measures Included in Project[2]	Estimated Effectiveness of Measures
Window coverings to reduce heat gain	Implementation measure RM-8.2.1 requires that homes be designed to include thermal window coverings to reduce heat gain during the summer.	Potential for substantial reductions in GHG emissions from building energy usage. Actual reduction would depend on the extent to which the buildings would exceed the Title 24 energy standards.
Energy efficient water heaters	Implementation measure RM-8.2.4 requires that homes be equipped with energy efficient water heaters and heat recovery drain systems.	Potentially between 1.2 and 18.4% of natural gas-fired water heater GHG emissions.
Minimize lighting needs	Implementation measure RM-8.2.8 requires home design features such as light towers, light wells, dormers, skylights, etc., to minimize daytime interior lighting needs.	Potential for substantial reductions in GHG emissions from building energy usage. Actual reduction would depend on the extent to which the buildings would exceed the Title 24 energy standards.
Programmable thermostats	Implementation measure RM-8.2.12 requires that programmable thermostats be installed with all residential heating systems.	There are no quantifiable reductions associated with this measure. However, this is a best management practice that influences building energy use for heating and cooling.

Representative GHG Reduction Measures[1]	Measures Included in Project[2]	Estimated Effectiveness of Measures
Manage fireplace type and use	Use of wood-burning stoves is prohibited. Only natural gas stoves are permitted.	There are no quantifiable reductions associated with this measure.
Efficient heating systems	Implementation measure RM-8.2.13 requires that all home heating systems have an Annual Fuel Use Efficiency (AFUE) of 95 percent or greater (see Recommended Measures below), and that ducts are properly sealed.	Potential for substantial reductions in GHG emissions from building energy usage. Actual reduction would depend on the extent to which the buildings would exceed the Title 24 energy standards.
Water Conservation		
Low water use appliances and fixtures	Implementation measure RM-5.2.5 requires that all homes be equipped with low water use washing machines and dishwashers and with low-flow water appliances.	Up to 20% reduction for indoor residential water use and associated GHG emissions.
Low water use landscaping systems and landscaping	Policy RM-5.2 requires facilitation of water conservation with implementation measures RM-5.2.1 through RM-5.2.4, which require drought tolerant landscaping on private lots and public areas, water saving irrigation systems, and low water use appliances. Policy RM 5.1 and its accompanying implementation measure RM-5.1.2 requires that new development comply with the San Benito County Water Conservation Plan, to reduce consumption of potable water.	Up to 6.1% or more reduction for outdoor water use and associated GHG emissions.

Representative GHG Reduction Measures[1]	Measures Included in Project[2]	Estimated Effectiveness of Measures
Gray water	Implementation measure RM-5.2.8 requires that all park, streetscape, front yards of all single-family dwellings and common areas of all multi-family dwellings be pre-plumbed to accommodate recycled water.	Potential reduction of up to 100% of outdoor water use and associated GHG emissions. Actual reduction would depend on the extent to which recycled water used for irrigation would replace potable water.
Solid Waste Diversion		
Re-Use Construction Materials	Implementation Measure RM-6.1.4 requires the diversion of a minimum of 25 percent of total materials taken off the construction site from landfills or incinerators	There are no quantifiable reductions associated with this measure. However, this is a best management practice.

Source: EMC Planning Group 2010

California Air Pollution Control Officers Association 2010

Notes: [1]Recommended measures are a synthesis of measures taken from the California Attorney General's *Addressing Climate Change at the Project Level* and CAPCOA's *CEQA and Climate Change – Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the Environmental Quality Act*. Measures are those that are applicable to a residential project of the type proposed and are within the control of the applicant or future project developers.

[2]Policies and implementation measures refer to those in the *Fairview Corners Specific Plan.* Refer to Appendix A, Goals, Policies and Implementation Measures of the *Fairview Corners Specific Plan* for a detailed list of policies and implementation measures.

State Regulations and AB 32 Measures Regulation Reductions

Although not relied upon in the CEQA impacts analysis for purposes of this Draft EIR, there are a number of other applicable state regulations and implementation measures that are considered and included in this EIR for informational purposes to better understand how the project's business as usual emissions may be reduced during the life of the project. Following is a description of the applicable regulatory measures that can be expected to reduce the proposed project's business as usual emissions.

- **Motor Vehicles, Project Design Features**: Emissions from motor vehicles would be reduced as detailed in the emission reduction percentages identified in Table 16.

- **Motor Vehicle, Pavley I Standards**: The Pavley I (AB 1493) regulation, which has already been adopted by the CARB, requires GHG emission reductions from passenger cars and light trucks up to the 2016 model year. The full effect of this AB 1493 regulation is expected to provide 27.7 $MMTCO_2e$ of emission reductions in 2016.

- **Motor Vehicles, Low Carbon Fuel Standard**: This regulation is designed to reduce GHG emissions by decreasing the carbon intensity of transportation fuels used in California. It is expected to reduce total emissions from passenger vehicles and heavy-duty trucks by 7.2 percent by the year 2020.

- **Motor Vehicles, Passenger Vehicle Efficiency:** The CARB has identified several measures that would further reduce tailpipe GHG emissions from passenger vehicles, by increasing vehicle efficiency, including ensuring proper tire inflation and solar-reflective automotive paint and window glazing (cool car standards). These measures are expected to reduce total emissions from passenger vehicles by 0.9 percent.

- **Natural Gas Combustions**: The CARB Scoping Plan Energy Efficiency measure includes a number of actions that are designed to reduce energy consumption of both natural gas and electricity through improvements in building and appliance efficiency and through efficiency in combustion of natural gas. Example efficiency improvements include the use of condensing heaters, tankless gas-fired on-demand heaters and other super efficient gas-fired heating appliances that will replace less efficient water and space heaters by attrition as they fail.

- **Electricity Generation**: The CARB Scoping Plan lists 12 strategies to maximize energy efficiency and reduce GHG emissions by more than 10 percent by 2020. In addition, there is an increased focus on satisfying the state's electric load with renewable resources including (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass,

anaerobic digestion, and landfill gas. California's current Renewable Portfolio Standard was intended to increase that share to 20 percent by 2010. Increased use of renewables will decrease California's reliance on fossil fuels, thus reducing emissions of GHG from the Electricity sector.

In view of the emissions reductions that are expected to result from recent new and evolving regulations, implementation of the proposed project is not anticipated to conflict with or impede the state's objectives of reducing GHG emissions as expressed in AB 32.

Contribution to Climate Change

As noted previously, emissions of GHGs and their contribution to global climate change are inherently a cumulative impact and, therefore, should be evaluated in this context. For instance, based on the modeling conducted for this project, long-term operation of the proposed project would generate a total of approximately 4,614 metric tons/year of CO_2e. For comparison purposes only, this would equate to approximately 0.001 percent of the 2008 statewide GHG emissions inventory. Although when evaluated in this context, project-generated emissions would likely be considered nominal, the cumulative contribution from multiple projects could conceivably result in a substantial overall contribution to the state's GHG inventory.

As discussed above, although a project may result in increased GHG emissions, it is important to note that increased emissions would not necessarily result in an adverse effect with regard to climate change. Although emissions of GHGs can be quantified, it is typically not possible to determine the extent to which project-generated GHGs would contribute to global climate change or the physical effects often associated with global climate change (e.g., loss of snow pack, sea-level rise, severe weather events, etc.). In addition, to account accurately for GHGs attributable to the proposed project, it would be necessary to differentiate between new sources that otherwise would not exist but for the project, and existing sources that have simply relocated to the project area.

Finally, the effectiveness of potential measures in reducing a project's contribution to global climate change cannot always be precisely determined. In 2010, CAPCOA released its white paper, which local governments can use as a resource for estimating and quantifying GHG reductions from various mitigation measures. The estimated reductions are presented in Table 16. As shown, the project would include measures that would yield reductions for GHG emissions from transportation, energy, water, and solid waste. The most substantial of these reductions would be from the project's bicycle and pedestrian-friendly measures, and its compliance with green building codes and/or LEED certification requirements. As a result, given the project design, building and siting features as discussed in the above analysis, this impact would be considered **less than significant**.

No mitigation is required.

Although not required mitigation measures, the project's design features discussed above and in Table 16, GHG Reduction Measures, shall be included in the project's Mitigation Monitoring and Reporting Program (MMRP) and conditions of approval to further assure their implementation.

Effects of Climate Change on the Proposed Project

It is difficult to predict the specific potential effects of climate change on future project residents or project infrastructure with any degree of reliability. This difficulty arises from the lack of geographic specificity inherent in models developed to date to assess potential climate changes. Due to the global scale of climate change, current climate models have, to date, largely been developed to analyze climate change on a broad geographic scale, not on a regional or site specific scale. Models sensitive enough to accurately measure impacts of climate change on a localized basis are generally not available.

As noted above, significant uncertainty exists about the geographic extent of global warming, the effects of warming, and the rate of warming over different geographic areas. Therefore, significant variability exists in the potential effects of warming on a regional or local level. However, some potential effects of climate change such as direct impacts from sea level rise can be dismissed for the proposed project simply due to its geographic location.

The impact of climate change on water availability is a key concern that is relevant for development in water constrained areas around the world, including portions of California. A number of models have been developed which evaluate potential effects of climate change on water supplies in California, especially surface water supplies tied to snowpack in the Sierra Nevada. Such analysis has not been conducted for water supply availability within the Sunnyslope County Water District (Sunnyslope) service area boundary, which includes the project site, for the reasons noted above regarding uncertainty and model specificity.

However, this Draft EIR contains information regarding water supply generally that is useful in evaluating this issue to the extent feasible (see Section 3.15, Wet and Dry Utilities and Energy). Water supply available from Sunnyslope is derived from both groundwater and surface water. Sunnyslope uses groundwater for approximately 70 percent of its supply and surface water from the Central Valley Project for the remaining 30 percent. Groundwater supply would appear to be somewhat buffered from surface water supply concerns related to a projected decline in Sierra Nevada snowpack. Surface water supplies derived from the Central Valley Project could be vulnerable due to climate change impacts (Kennedy/Jenks 2008). Therefore, it is possible that Sunnyslope's ability to provide long-term water supplies could be indirectly affected by climate change. Sunnyslope is actively integrating climate change planning and adaptation into its long-

range water supply planning processes so that potential effects of climate change can be factored into its assessment of long-term water supply availability. This will help assure that over time, Sunnyslope will identify changes, if any, which may be needed in its water supply planning processes to address water supply availability as it may be affected by climate change.

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