4.7 GREENHOUSE GAS EMISSIONS/CLIMATE CHANGE

This section evaluates the potential global climate change impacts associated with the Project. The proposed Project's potential direct and cumulative contribution to greenhouse gas emissions and global climate change are analyzed. Additionally, it also recommends mitigation measures to avoid or lessen the significance of potential impacts. Information presented in this section is based upon numerous background and technical materials and documentation including, among others, the County of San Benito's General Plan, the proposed 2035 General Plan Update (which is included for informational purposes only), the San Benito County Code, and Air Quality Data provided by the California Air Resources Board (CARB). Land use and traffic data are based on the proposed San Juan Oaks Specific Plan, and the Project's Traffic Impact Analysis (Appendix I). Refer to Section 4.3, *Air Quality*, for detailed construction-related and operational emissions, as well as additional background information on air quality. Refer to Appendix D for detailed air quality modeling assumptions and results. Climate change modeling and mitigation guidance is taken from numerous sources noted in the text, including the CARB Scoping Plan (October 2008), the California Air Pollution Control Officers Association (CAPCOA) CEQA and Climate Change White Paper (January 2008), CAPCOA, Quantifying Greenhouse Gas Mitigation Measures (September 2010), and the California Attorney General recommended mitigation measures.

4.7.1 Setting

a. Climate Change and Greenhouse Gases. Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) (CEQA Guidelines § 15364.5). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. GHGs have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to climate change. GHG and climate change are by definition cumulative impacts, as they affect the accumulation of greenhouse gases in the atmosphere. Although emissions of one single project will not cause climate change, GHG emissions from multiple projects (past, present and future) throughout the world could result in a cumulative impact with respect to climate change.

Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potentials (GWPs). The

GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane CH_4 has a GWP of 25, meaning its global warming effect is 25 times greater than carbon dioxide on a molecule per molecule basis (United Nations Intergovernmental Panel on Climate Change [IPCC], 2006).

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

Carbon Dioxide. CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration, with the first conclusive measurements being made in the last half of the 20th century. Concentrations of CO_2 in the atmosphere have risen approximately 40% since the industrial revolution. The global atmospheric concentration of CO_2 has increased from a pre-industrial value of about 280 parts per million (ppm) to 391 ppm in 2011 (IPCC, 2007; Oceanic and Atmospheric Association [NOAA], 2010). The average annual CO_2 concentration growth rate was larger between 1995 and 2005 (average: 1.9 ppm per year) than it has been since the beginning of continuous direct atmospheric measurements (1960–2005 average: 1.4 ppm per year), although there is year-to-year variability in growth rates (NOAA, 2010). In 2010, CO_2 represented an estimated 82.8% of total GHG emissions (Department of Energy [DOE] Energy Information Administration [EIA], August 2010).

Methane. Methane (CH_4) is emitted from both non-biogenic and biogenic sources. Non-biogenic sources of CH_4 include fossil fuel mining and burning, biomass burning, waste treatment, geologic sources, coal mining, certain industrial processes and leaks in natural gas pipelines. Biogenic sources include enteric fermentation associated with domestic livestock, landfills, natural gas and petroleum systems, agricultural activities, wetlands, rice agriculture, oceans, forests, fires, termites and geologic sources (U.S. EPA, April 2012). Methane is an effective absorber of radiation, though its atmospheric concentration is less than that of CO_2 and its lifetime in the atmosphere is limited to 10 to 12 years. It is a GWP approximately 25 times that of CO_2. Over the last 250 years, the concentration of CH_4 in the atmosphere has increased by 148 percent (IPCC, 2007), although emissions have declined from 1990 levels.

Nitrous Oxide. Concentrations of nitrous oxide (N_2O) began to rise at the beginning of the industrial revolution and continue to increase at a relatively uniform growth rate (NOAA, 2010). N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes. Use of these fertilizers has increased over the last century. Agricultural soil management and mobile source fossil fuel combustion are the major sources of N_2O emissions. The GWP of nitrous oxide is approximately 298 times that of CO_2 (IPCC, 2007).

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

b. Greenhouse Gas Emissions Inventory. Total U.S. GHG emissions were 6,821.8 million metric tons (MMT) CO_2e in 2009 (United States Environmental Protection Agency [U.S. EPA], April 2012). Total U.S. emissions have increased by 10.5 percent since 1990; emissions rose by 3.2 percent from 2009 to 2010 (U.S. EPA, April 2012). This increase was primarily due to (1) an increase in economic output resulting in an increase in energy consumption across all sectors; and (2) much warmer summer conditions resulting in an increase in electricity demand for air conditioning. Since 1990, U.S. emissions have increased at an average annual rate of 0.5 percent. In 2010, the transportation and industrial end-use sectors accounted for 32 percent and 26 percent of CO_2 emissions from fossil fuel combustion, respectively. Meanwhile, the residential and commercial end-use sectors accounted for 22 percent and 19 percent of CO_2 emissions from fossil fuel combustion, respectively (U.S. EPA, April 2012).

Based upon the California Air Resources Board (CARB) California Greenhouse Gas Inventory for 2000-2011 (CARB, October 2011), California produced 448 MMT CO_2e in 2011. The major source of GHGs in California is transportation, contributing 38 percent of the state's total GHG emissions. Industrial activity is the second largest source, contributing 21 percent of the state's GHG emissions (ARB, October 2011). California emissions are due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. The CARB has projected statewide unregulated GHG emissions for the year 2020 will be 507 MMT CO_2e (ARB, August 2013). These projections represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

c. Potential Effects of Climate Change. According to the CalEPA's *2010 Climate Action Team Biennial Report*, potential impacts of climate change in California may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CalEPA, April 2010). Below is a summary of some of the potential effects that could be experienced in California as a result of climate change.

Sea Level Rise. According to *The Impacts of Sea-Level Rise on the California Coast*, prepared by the California Climate Change Center (CCCC) (May 2009), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. Sea levels are rising faster now than in the previous two millennia, and the rise is expected to accelerate, even with robust GHG emission control measures. The most recent IPCC report (2013) predicts a mean sea–level rise of 11-38 inches by

2100. This prediction is more than 50% higher than earlier projections of 7-23 inches, when comparing the same emissions scenarios and time periods. The previous IPCC report (2007) identified a sea level rise on the California coast over the past century of approximately eight inches. Based on the results of various climate change models, sea level rise is expected to continue. The California Climate Adaptation Strategy (California Natural Resources Agency, December 2009) estimates a sea level rise of up to 55 inches by the end of this century.

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

Water Supply. Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California. However, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record (California Department of Water Resources [DWR], 2008; CCCC, May 2009).

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

Hydrology. As discussed above, climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. The rate of increase of global mean sea levels over the 2001-2010 decade, as observed by satellites, ocean buoys and land gauges, was approximately 3.2 mm per year, which is double the observed 20th century trend of 1.6 mm per year (World Meteorological Organization [WMO], 2013). As a

result, sea levels averaged over the last decade were about 8 inches higher than those of 1880 (WMO, 2013). Sea level rise may be a product of climate change through two main processes: expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply due to salt water intrusion. Increased CO_2 emissions can cause oceans to acidify due to the carbonic acid it forms. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture. California has a $30 billion annual agricultural industry that produces half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC, 2006).

Ecosystems and Wildlife. Climate change and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists project that the average global surface temperature could rise by 1.0-4.5°F (0.6-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan, 2004; Parmesan, C. and H. Galbraith, 2004).

Effects Within San Benito County. Increasing temperatures in California would indirectly affect the County through changes in water supply, sea levels, water quality, agriculture, and energy consumption rates. Although various climate change models predict some increase in variability of weather patterns and an increasing incidence of extreme weather events, there is no consistency among the model results, with some predicting increased incidents of droughts and others predicting increased frequency of severe storm events. Given the uncertainty associated with projecting the type and extent of changes in climatic variability and the speculative nature of predicting incidents of extreme weather events, the effect on the county of changing patterns of storms and other extreme weather remains unclear. Based on the results of a variety of regional climate models and literature, it is reasonably foreseeable that snowpack will be reduced and/or will melt earlier or more rapidly in watersheds that feed the Central Valley Project (CVP). Consequently, changes in snowpack could affect the County indirectly by altering the timing and volume of runoff that feeds the CVP, which supplies much of the northern portion of San Benito County's water supply. As a result, CVP deliveries to the County may decrease over time (San Benito County, November 2010).

Increased risk of drought presents increased risk of wildfire hazards. However, most urbanized areas of the county are bounded by agricultural land that is actively farmed or fallow, and are not generally adjacent to any wildlands. As the county continues to grow and development encroaches further into wildland interface areas, the potential for wildland fires will increase (San Benito County, November 2010).

e. Regulatory Setting. The following regulations address both climate change and GHG emissions.

Federal Regulations. The United States Supreme Court in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120) held that the U.S. EPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act. The U.S. EPA publishes an annual GHG inventory (Inventory of U.S. Greenhouse Gas Emissions and Sinks), which tracks the national trend in GHG emissions and removals back to 1990. The report contains total U.S. emissions by source, economic sector, and GHG. U.S. EPA uses national energy data, data on national agricultural activities, and other national statistics to provide a comprehensive accounting of total GHG emissions for all man-made sources in the United States. U.S. EPA also collects GHG emissions data from individual facilities and suppliers of certain fossil fuels and industrial gases through the Greenhouse Gas Reporting Program (U.S. EPA, April 2012).

On September 15, 2009, the U.S. EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States. The standards that make up this proposed national program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon (MPG) if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. The U.S. EPA does not regulate residential sources of GHG emissions.

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

Assembly Bill (AB) 1493. Assembly Bill (AB) 1493 (2002), referred to as "Pavley," requires ARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, U.S. EPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction from 2009 levels by 2012 and 30 percent by 2016. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, when the rules would be fully implemented, new automobiles would emit 34% fewer GHGs. Statewide CO_2e emissions would be reduced by 3% by 2020 and by 12% by 2025. The reduction increases to 27% in 2035 and even further to a 33% reduction in 2050 (CARB, 2013).

Executive Order S-3-05. In 2005, former Governor Schwarzenegger issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. EO S-3-05 provides that by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels;

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

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

After completing a comprehensive review and update process, ARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2e. The Scoping Plan was approved by ARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted over the last five years. Implementation activities are ongoing and ARB is currently the process of updating the Scoping Plan.

In May 2014, ARB approved the first update to the AB 32 Scoping Plan. The 2013 Scoping Plan update defines ARB's climate change priorities for the next five years and sets the groundwork to reach post-2020 goals set forth in EO S-3-05. The update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use (ARB, 2014). The Scoping Plan includes a comprehensive list of recommended actions for each of the major sectors of the State-wide emissions inventory, including energy actions, transportation actions, agriculture actions, water actions, waste management actions, natural and working lands actions, short-lived climate pollutants actions, green building actions, cap-and-trade actions, and evaluations actions.

The AB 32 Scoping Plan also identifies a cap-and-trade program as one of the strategies California will employ to reduce the GHG emissions. Under the cap-and-trade program, an overall limit on GHG emissions from capped sectors will be established and facilities subject to the cap will be able to trade permits (allowances) to emit GHGs. The program began on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions.

Senate Bill (SB) 375. Senate Bill (SB) 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing ARB to develop regional GHG emission reduction targets to be achieved from vehicles for 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPOs) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010, CARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Monterey Bay Unified Air Pollution Control District (MBUAPCD) was assigned targets of a 0% reduction in GHGs from transportation sources from 2005 levels by 2020 and a 5% reduction in GHGs from transportation sources from 2005 levels by 2035.

In April 2011, Governor Brown signed SB 2X requiring California to generate 33% of its electricity from renewable energy by 2020.

California Building Code. Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2008 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires he design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code was adopted as part of the California Building Standards Code (CALGreen) (Part 11, Title 24, CCR). The green building standards that became mandatory in the 2010 edition of the code established voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The mandatory provisions of the California Green Building Code Standards became effective January 1, 2011.

2006 Appliance Efficiency Regulations. The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the California Energy Commission on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non-federally regulated appliances. While these regulations are now often viewed as "business-as-usual," they exceed the standards imposed by all other states and they reduce GHG emissions by reducing energy demand.

California Environmental Quality Act. The *State CEQA Guidelines* contains provisions regarding the analysis and feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted *CEQA Guidelines* provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, the South Coast Air Quality Management District (SCAQMD), the San Luis Obispo Air Pollution Control District (SLOAPCD), and the San Joaquin Air Pollution Control District (SJVAPCD) have adopted quantitative significance thresholds for GHGs. The MBUAPCD, as the regional air agency for the North Central Coast Air Basin, has

air-permitting authority in San Benito County. In February 2008, the MBUAPCD issued revised adopted guidance for assessing and reducing the impacts of project-specific air quality emissions: CEQA Air Quality Guidelines. This document included a reserved section to address project-specific GHG emissions: Climate Change and Assessment of Project Impacts from Greenhouse Gases. To date, the MBUAPCD has not adopted guidance for GHG emissions inventory, or established significance thresholds for GHG emissions.

Local Regulations.

MBUAPCD Air Quality Planning Documents. As described above, MBUAPCD provides guidance for assessing and reducing the impacts of project-specific air quality emissions: CEQA Air Quality Guidelines. However, MBUAPCD has not established significance thresholds for GHG emissions.

Current Adopted San Benito County General Plan. Following are relevant goals and policies from the existing, adopted San Benito County General Plan (1985): the Land Use Element includes Policy 35, which encourages energy and water conservation techniques and energy efficiency in all new building design, orientation and construction; the Housing Element includes "Goals for Energy Conservation," which establishes development and construction standards which encourage energy conservation in residential uses; and Open Space and Conservation Element includes Policy 29, which encourages the use of energy-efficient design in new construction.

Land Use Element:

Policy 35 *The County shall encourage energy and water conservation techniques and energy efficiency in all new building design, orientation and construction.*

Housing Element:

Energy Conservation. To establish development and construction standards which encourage energy conservation in residential uses. Promote the use of energy conservation methods in housing for all segments of the community.

Policy 5A *The County shall require energy-conserving construction, as required by state law.*

Policy 5B *The County shall encourage innovative site designs and orientation techniques, which incorporate passive and active solar designs and natural cooling techniques.*

Policy 5C *The County shall promote a weatherization and retrofit program for existing housing units that fall below current state performance standards for energy efficiency.*

Policy 5D *The County shall promote opportunities for use of solar energy by assuring solar access. The County shall pursue all avenues of solar access and energy conservation currently provided by California law and consider a local ordinance to further promote energy conservation.*

Policy 5E *The County shall promote energy efficient land use planning by incorporating energy conservation as a major criterion for future decision making.*

Policy 5F *The County shall promote energy conservation through education and outreach programs.*

Policy 5G *The County shall require solar access to be considered in environmental review and/or decision-making for all subdivisions.*

Open Space and Conservation Element:

Policy 29 *Energy Conservation. It will be the County's policy to encourage the use of energy-efficient design in new construction.*

Consistent with the above-referenced General Plan goals and policies, the Project would require energy-efficient features including roof colors and materials that meet or exceed Energy Star requirements to reduce the heat island effect; energy and water-efficient appliances, fixtures, lighting, and windows that meet or exceed state energy performance standards; high-efficient air conditioners; and Energy Star bath fans in each home. In addition, the Project includes Design Guidelines that encourage the use of energy-efficient windows, rooftop solar and other small-scale renewable energy sources, Energy Star qualified (or equivalent rating system) models of mechanical equipment, and energy-efficient, low voltage exterior lighting.

In addition, the existing, adopted San Benito County General Plan (1985) Open Space and Conservation Element includes Policy 10, which commits the County to protecting air quality through land use decisions that limit vehicle trip reduction. Policy 10 does not specifically address GHG emissions, but the provisions of Policy 10 would have the secondary effect of reducing County-wide GHG emissions in addition to criteria air pollutants.

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.*

Action 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.*

Action 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.*

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

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

Draft 2035 General Plan Update. The proposed (but not yet adopted) Draft 2035 General Plan Update Land Use Element, Natural Resources and Conservation Element, Circulation Element, Public Facilities and Services Element, and Health and Safety Element, provide the following goals, policies and objectives pertaining to greenhouse gas emissions. Because the Draft 2035 General Plan Update has not yet been adopted by the Board of Supervisors, these policies are included for informational purposes only.

Land Use Element:

LU-1.2 *Sustainable Development Patterns. The County shall promote compact, clustered development patterns that use land efficiently; reduce pollution and the expenditure of energy and other resources; and facilitate walking, bicycling, and transit use; and encourage employment centers and shopping areas to be proximate to residential areas to reduce vehicle trips. Such patterns would apply to infill development, unincorporated communities, and the New Community Study Areas. The County recognizes that the New Community Study Areas comprise locations that can promote such sustainable development.*

Goal LU-2 *To promote energy efficiency through innovative and sustainable building and site design.*

LU-2.1 *Sustainable Building Practices. The County shall promote, and where appropriate, require sustainable building practices that incorporate a "whole system" approach to designing and constructing buildings that consume less energy, water, and other resources; facilitate natural ventilation; use daylight efficiently; and are healthy, safe, comfortable, and durable.*

LU-2.2 *Green Sustainable Building Practices. The County shall encourage sustainable building practices that go beyond the minimum requirements of the Title 24 CalGreen Code (i.e., Tier 1 or Tier 2 measures) and to design new buildings to achieve a green building standard such as Leadership in Energy and Environmental Design (LEED).*

LU-2.4 *Solar Access. The County shall encourage new residential subdivisions and new commercial, office, industrial, and public buildings to be oriented and landscaped to enhance natural lighting and solar access in order to maximize energy efficiency.*

LU-2.5. *Energy Retrofits. The County shall promote the retrofitting of existing buildings with new and innovative energy and water efficiency technologies and encourage structures being renovated to be built to a green building standard such as Leadership in Energy and Environmental Design (LEED).*

LU-2.6. *Green Building Standard. The County shall require all new County buildings be constructed to green building standards, such as Leadership in Energy and Environmental Design (LEED), and all existing County buildings to be retrofitted with energy efficient technologies.*

LU-2.7 *Sustainable Location Factor. The County shall encourage new development in locations that provide connectivity between existing transportation facilities to increase efficiency, reduce congestion, and improve safety.*

LU-4.2 *Urban Residential Development. The County shall ensure new urban residential development (e.g., greater than two units per acre) occurs in areas that have, or can provide, adequate public facilities and services to support such uses, and are near existing and future major transportation networks, transit and/or bicycle corridors, pedestrian paths and trails, and employment centers.*

LU-4.5 *Innovative Site Planning and Residential Design. The County shall encourage new residential developments to use innovative site planning techniques and to incorporate design features that increase the design quality, and energy efficiency, and water conservation of structures and landscapes while protecting the surrounding environment.*

Natural Resources and Conservation Element:

NCR-6.1. *Local Renewable Energy. The County shall strive to increase the supply of locally-produced, renewable energy (e.g., solar, wind, geothermal, and biomass) in order to promote energy independence and efficiency.*

NCR-6.2. *Review of Energy Facility Proposals. The County shall provide for the thorough and expeditious evaluation of renewable energy facility proposals, including the siting and operation of such facilities in an environmentally sound manner.*

NCR-6.3. *Energy Facilities. The County shall require the siting of energy facilities in a manner that is compatible with surrounding land uses and protects scenic resources.*

Circulation Element:

C-1.2 *Complete Streets. To promote a road and street network that accommodates cars without requiring car dependence, the County shall plan for use of roadways by all vehicle types and users, including automobiles, trucks, alternative energy vehicles, agricultural equipment, transit, bicyclists, and pedestrians, when constructing or modifying roadways. Additionally, the County shall plan its road and street network to reflect a context-sensitive approach to the design of thoroughfare assemblies, where the allocation of right-of-way and the facilities provided are based on the intended character, whether urban or rural, of a particular location (urban context). Roads and streets within communities shall be designed to support and encourage walkability as a response to their context, whereas roads in open areas of the County shall be designed primarily for vehicular circulation. As such, thoroughfares that serve both open areas and communities in the County shall change as the surrounding urban context varies. This includes:*

a. Encouraging thoroughfare designs that are context sensitive, such as those recommended in Designing Walkable Urban Thoroughfares: A Context Sensitive Approach by the Institute of Transportation Engineers (ITE);

b. Supporting urban design principles that promote walkability within communities to include:

i. A mix and variety of land uses designed to be relatively compact and in proximity to one another;

ii. Buildings that are oriented toward streets, with appropriately narrow setbacks and functional entries directly fronting onto sidewalks;

iii. Pedestrian-scaled architecture, landscape, and thoroughfares designed to provide engaging sidewalk views and comfort to pedestrians traveling at slow speeds; and

iv. Circulation networks that provide an interconnected system of streets and open spaces with relatively small block lengths;

c. Creating multi-modal street connections in order to establish a comprehensive, integrated, and connected transportation network;

d. Incorporating pedestrian and bicycle facilities, where appropriate and feasible, that promote safety and maximize access;

e. Planting street trees adjacent to curbs and between the street and sidewalk or walking path to provide a buffer between the pedestrian and the automobile, where appropriate;

f. Incorporating traffic calming devices such as roundabouts, bulb-outs at intersections, and traffic tables; and

g. Coordinating with other agencies and cities to ensure connections are made between jurisdictions.

C-2.1 *Bicycle, Pedestrian, and Equestrian Systems. The County shall encourage complete, safe, and interconnected bicycle, pedestrian, and equestrian systems, as appropriate to the context, that serve both commuter travel and recreational use, and provide access to major destinations in the county.*

C-2.2 *Pedestrian and Bike Path Construction. The County shall plan, design, and construct pedestrian routes and bikeways consistent with the 2009 County Bikeway and Pedestrian Master Plan or its succeeding plan. Priority shall be given to bicycle commuting routes, routes to schools, bike lanes on all new streets classified as arterials or collectors, and bike lanes on or adjacent to existing heavily traveled roads.*

C-2.3 *Bicycle Parking Facilities. The County shall provide or encourage the provision of secure bicycle parking facilities at transit facilities, private and public facilities, and park-and-ride lots.*

C-2.8 *Sidewalks or Pedestrian Paths in Subdivisions. The County shall encourage project applicants to provide sidewalks or pedestrian paths, or other safe and convenient accommodations for pedestrians (e.g., shared-space streets) on all new roads or modifications to existing roads, as appropriate to the context, in accordance with County roadway design standards.*

C-2.10 *Paths Through Cul-de-Sacs. The County shall encourage developments at a density of one unit per acre or greater to include paths for bicycle and pedestrian traffic through or near the ends of loop streets and cul-de-sacs over 500 feet in length and to facilitate bicycle and pedestrian travel.*

C-3.9 *Consistency with RTP. The County shall require all new development proposals to be consistent with and implement the San Benito County Regional Transportation Plan transit policies.*

Public Facilities and Services Element:

PFS-1.10 *Maximize Use of Existing Facilities. The County shall require new development projects to be designed and sited to use existing facilities and services to the extent practical and to the extent that such a design and site choice would be consistent with good design principles.*

PFS-7.5 *Waste Diversion. The County shall require waste reduction, recycling, composting, and waste separation to reduce the volume and toxicity of solid wastes sent to landfill facilities and to meet or exceed State waste diversion requirements of 50 percent.*

PFS-7.6 *Construction Materials Recycling. The County shall encourage recycling and reuse of construction waste, including recycling materials generated by the demolition of buildings, with the objective of diverting 50 percent to a certified recycling processor. The County shall encourage salvaged and recycled materials for use in new construction.*

PFS-8.7 *Renewable Energy Grid-Connections. The County shall coordinate with public utility providers to design their facilities so that private and public onsite renewable energy facilities (e.g. solar, wind, biomass, geothermal) can connect to the larger electricity grid.*

Health and Safety Element:

HS-5.7. *Greenhouse Gas Emission Reductions. The County shall promote greenhouse gas emission reductions by supporting carbon efficient farming methods (e.g., methane capture systems, no-till farming, crop rotation, cover cropping); supporting the installation of renewable energy technologies; and protecting grasslands, open space, oak woodlands, riparian forest and farmlands from conversion to urban uses.*

HS-5.8. *GHG Reduction Targets. The County shall strive to reduce greenhouse gas (GHG) emissions by 15 percent below 2010 levels by 2020, and establish a long-term goal to reduce GHG emissions by 80 percent below 1990 levels by 2050.*

HS-5.9. *GHG Reduction Monitoring. The County shall monitor progress in meeting its greenhouse gas reduction targets and make appropriate adjustments to its programs and standards to further efforts to achieve GHG reduction targets.*

The consistency of the Project with applicable County General Plan and Draft 2035 General Plan Update goals, policies and objectives pertaining to greenhouse gas emissions/climate change, including key policies listed above, is evaluated in Section 4.10, *Land Use*. However, with respect to the Draft 2035 General Plan Update, because it has not been adopted by the Board of

Supervisors as of the writing of this SEIR, this consistency analysis is being provided for informational purposes only.

4.7.2 Previous Environmental Review

The *2003 San Juan Oaks Golf Club General Plan Amendment/Zone Change/Vesting Tentative Subdivision Map EIR* (2003 EIR) did not examine the potential greenhouse gas-related impacts resulting from development under the San Juan Oaks Golf Club General Plan Amendment/Zone Change/Vesting Tentative Subdivision Map Project as the CEQA thresholds of significance were not adopted for GHG until after the 2003 EIR was prepared.

In addition, substantial changes to the previously approved 2003 San Juan Oaks Golf Club project are proposed as part of Del Webb at San Juan Oaks Specific Plan Project. The 2003 San Juan Oaks Golf Club project included a General Plan Amendment/Zone Change/Vesting Tentative Tract Map. This previously approved project allowed for the development of 156 market rate residential units, 30 affordable units, a resort hotel, a village commercial site, a park, a permanent wildlife habitat/open space, an additional 18-hole golf course, and an additional nine-hole golf course. None of the previously approved uses have been constructed.

The development footprint of the 2003 San Juan Oaks Golf Club Project and the current proposed Project are substantially similar, as shown in Figure 1-1 in Section 1.0, *Introduction*. However, substantial changes to the previously approved 2003 San Juan Oaks Golf Club project are proposed as part of Del Webb at San Juan Oaks Specific Plan Project. Specifically, the Del Webb at San Juan Oaks Specific Plan Project proposes to increase the previously approved overall impervious building area from approximately 193 acres to approximately 323 acres, increase the total number of residential dwellings from 186 single-family residential dwellings to 1,084 single-family residential dwellings, increase the neighborhood commercial area from approximately seven acres to approximately 14 acres, increase roadway areas from approximately 44 acres to approximately 88 acres, increase the permanent wildlife habitat/open space from approximately 1,163 acres to approximately 1,243 acres, and develop an approximately ten-acre amenity center. In addition, the Project provides for the permanent preservation of approximately 153 acres of off-site prime agricultural land. Due to the revisions to the Project and the updated application of the CEQA thresholds of significance as they relate to GHG since the 2003 EIR was certified, the following impact analysis has been prepared pursuant to Public Resources Code Section 21166 and CEQA Guidelines Section 15162 (a).

4.7.3 Impact Analysis

a. Methodology and Significance Thresholds. The *State CEQA Guidelines* provides for the analysis and feasible mitigation of GHG emissions or the effects of GHG emissions. Section 15064.4, and Appendix G of the *State CEQA Guidelines* provide guidance regarding the criteria that may be used to assess whether a project's impacts on climate change are significant. These guidelines are used in evaluating the cumulative significance of GHG emissions from the proposed Project. Section 15064.4(a) provides lead agencies with the discretion to determine, in the context of a particular project, whether to:

1) *Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or*
2) *Rely on a qualitative analysis or performance based standards.*

Section 15064.4(b) states that a lead agency should consider the following factors when assessing the significance of impacts from GHG emissions:

1) *The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting.*
2) *Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*
3) *The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.*

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

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

The issue of climate change for an individual project typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

Neither the State, MBUAPCD, nor San Benito County have adopted GHG emissions thresholds, and no GHG emissions reduction plan with established GHG emissions reduction strategies has yet been adopted. The MBUAPCD is currently in the process of developing GHG emissions thresholds for evaluating projects under CEQA. According to an MBUAPCD staff report to the District Board of Directors, MBUAPCD currently recommends a threshold of 10,000 metric tons (MT) of CO_2e per year for stationary source projects and a threshold of 2,000 MT CO_2e per year for land-use projects or compliance with an adopted GHG Reduction Plan/Climate Action Plan. MBUAPCD is currently evaluating a percentage-based threshold option (MBUAPCD, 2013). However, MBUAPCD does not have a formally adopted policy recommending specific thresholds; therefore neither of these thresholds is in effect at this time.

In April 2012, SLOAPCD, which is adjacent to MBUAPCD to the south, adopted quantitative emissions thresholds for carbon dioxide equivalent (MT CO_2e) for most land use projects (SLOAPCD *CEQA Handbook*, Section 3.5.1, Significance Thresholds for Project-Level Operational Emissions, April 2012). The SLOAPCD *CEQA Handbook* includes a bright-line threshold of 1,150 MT CO_2e, as well as an efficiency threshold of 4.9 MT CO_2e per service population per year

(service population is the total residents and employees accommodated by the proposed project). The MBUAPCD encourages lead agencies to consider a variety of metrics for evaluating GHG emissions and related mitigation measures as they best apply to the specific project. As identified in §15064.7(c) of the CEQA Guidelines, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence. Given the nature of the proposed Project, the most appropriate threshold available to evaluate potential GHG emissions impacts is the SLOAPCD's adopted efficiency threshold of 4.9 MT CO_2e per service population per year. The efficiency threshold is the most appropriate threshold option for large projects such as specific plans, because it avoids penalizing large projects that incorporate emissions-reducing features and/or that are located in a manner that results in relatively low vehicle miles traveled. The efficiency threshold was designed to ensure that new development would be in compliance with the state's emissions reduction goals, as embodied in AB 32's goal of reducing GHG emissions to 1990 levels by 2020 and the Scoping Plan's strategies for achieving this reduction. Therefore, the Project's contribution to cumulative impacts related to GHG emissions and climate change would be cumulatively considerable if the Project would produce more than 4.9 MT CO_2e per service population per year.

As described in Section 5.0, *Other CEQA Discussions,* residential units constructed as part of the Project would house approximately 1,993 people; a total of approximately 547 permanent jobs would be generated by the retail operations, hotel space, and household spending under the Project; approximately 80 additional jobs would be supported by the operations of the Project's amenity center, the Project's HOA, and the San Juan Oaks Golf Club. Therefore, the service population for the Project is 2,620 for purposes of this analysis.

In addition, the *CEQA Guidelines* Appendix F requires that EIRs include a discussion of the potential energy consumption and/or conservation impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, or unnecessary consumption of energy. This discussion is included in Section 5.0, *Other CEQA Discussions*.

Study Methodology. Calculations of CO_2, CH_4, and N_2O emissions are provided to identify the magnitude of potential Project effects. The analysis focuses on CO_2, CH_4, and N_2O because these GHGs comprise 98.9 % of all GHG emissions by volume (IPCC, 2007) and are the GHG emissions that the Project would emit in the largest quantities. Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis. However, fluorinated gases are primarily associated with industrial processes, and the Project does not include an industrial component. Emissions of all GHGs are converted into their equivalent weight in CO_2 (CO_2e). Minimal amounts of other main GHGs (such as chlorofluorocarbons [CFCs]) would be emitted; however, these other GHG emissions would not substantially add to the calculated CO_2e amounts. Calculations are based on the methodologies discussed in the California Air Pollution Control Officers Association (CAPCOA) *CEQA and Climate Change* white paper (January 2008) and included the use of the California Climate Action Registry (CCAR) General Reporting Protocol (January 2009).

Construction Emissions. In order to estimate the annual emissions that would result from construction activity associated with the Project, GHGs from construction projects are

quantified and amortized over the life of the Project. The amortized construction emissions are added to the annual average operational emissions and then compared to the applicable operational threshold. To amortize the emissions over the life of the Project, the total GHG emissions for the construction activities are quantified, then divided by the Project life then added to the annual operational phase GHG emissions. For the purpose of this analysis, the estimated Project lifetime was assumed to be 50 years. A 50-year project lifetime is within the range used by air districts that employ this methodology for annualizing short-term emissions, including SLOAPCD (SLOAPCD, April 2012). As discussed previously, MBUPACD does not currently have adopted guidance for quantification of GHG emissions; therefore adopted guidance based on substantial evidence developed by other air districts, including SLOAPCD, is considered appropriate for use. As discussed in Section 4.3, *Air Quality*, it was assumed that grading would be balanced within the Project Site, and that no off-site import or export of soil would be required during Project construction. This analysis assumes that construction of the proposed Project would begin in 2015, and occur in five development phases over approximately ten years. While development phases may overlap, the GHG emissions inventory includes the total volume of GHG emissions that would be produced from construction activity on the Project Site (annualized over the lifetime of the Project, as described above), and is not dependent on the timing of construction activity and associated GHG emissions. Annualizing total construction GHG emissions using this methodology accurately accounts for temporary construction emissions as part of the Project's annual GHG emissions, which are compared to the applicable annual GHG threshold.

The emissions from each phase of the Project were estimated individually using CalEEMod because construction of the individual phases may occur separately. This modeling incorporated Project-specific inputs, including land use types and sizes because construction of the individual phases may occur separately or may overlap. CalEEMod is a computer model developed by the South Coast Air Quality Management District (SCAQMD) to estimate air pollutant and GHG emissions from land use development projects based on input values specific to the proposed development as well as local default values provided by the various air districts in California (MBUAPCD for projects in San Benito County). Given the nature of the Project, details about construction activity, such as schedule and specific equipment that would be required, are not currently available. Therefore, default values for the duration of each phase of construction as well as required off-road equipment from CalEEMod have been used for this analysis. This modeling assumes that construction equipment and truck emissions will decrease in the future as newer equipment that is required to meet more stringent emission standards, replacing existing equipment. As a result, CalEEMod computes lower emissions for future years. Because the OFFROAD2007 model is integrated in the current version of CalEEMod, the model does not incorporate new regulations adopted after 2007, including the effect of new State regulations that require fleet construction equipment and truck fleet operators to replace or retrofit their fleets to expedite reductions in emissions.

The five anticipated phases of the Project are described in Section 2.0, *Project Description,* and shown in Table 4.7-1. Figure 2-13 and Table 2-10 in Section 2.0, *Project Description*, identify proposed development phasing within the Project Site. Complete results from CalEEMod and assumptions can be viewed in Appendix D.

Table 4.7-1
Phasing Plan

Phase	Gross Area (approx. acres)	Residential Units	Non-Residential (approx.)
1	1,410	270	
2	85	262	25,000 sf[1]
3	82	278	
4	79	207	
5	338	67	200 rooms[2]/65,200 sf[3]
Total	**1,994 acres[4]**	**1,084 units**	

1. *Amenity Center*
2. *Resort Hotel*
3. *Neighborhood Commercial, including Assisted Living Center*
4. *Due to rounding, numbers do not sum accurately*

On-Site Operational Emissions. Operational emissions from energy use (electricity and natural gas use) for the Project were estimated using CalEEMod (see Appendix D for calculations). The default values on which CalEEMod are based include the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) for non-residential land uses and Residential Appliance Saturation Survey (RASS) for residential land uses. This methodology is considered reasonable and reliable for use, as it has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC. It is also recommended by CAPCOA (January 2008).

The modeling of operational emissions also incorporates, where applicable, green building design guidelines for the proposed Project that would reduce GHG emissions as compared to traditional development techniques. These are described in detail in Section 2.0, *Project Description*, and include the use of recycled building materials, energy-efficient lighting, high-efficiency appliances, water-efficient fixtures, low-water use landscape irrigation, and an option for photovoltaic installation on structures. These Project components and design guidelines include reduced overall water consumption factors from the Project-specific Water Supply Assessment (Tully & Young, December 2014; refer to Section 4.14, *Utilities and Service Systems*), solid-waste generation factors consistent with AB 939 (which mandates that local jurisdictions meet a solid waste diversion goal of 50 percent), and the most recent locally-appropriate Department of Resources Recycling and Recovery (CalRecycle) solid waste generation rates, and a specific reduction in water use associated with the required low-flow toilets. Proposed green building design guidelines that may also reduce GHG emissions, but were not included in the operational emissions estimate, include: the use of recycled building materials, energy-efficient lighting, energy-efficient appliances, and an option for photovoltaic installation on structures. These guidelines either do not currently provide sufficient quantifiable components to provide an emissions reduction estimate (e.g., the number and/or specification of energy-efficient lights/appliances), or are not mandatory/enforceable (e.g., photovoltaic installations are permitted, but optional).

Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coating, were calculated in CalEEMod based on standard emission rates from CARB, U.S. EPA, and district supplied emission factor values (CalEEMod User's Guide, 2013).

Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User's Guide, 2013). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

Direct Emissions from Mobile Combustion. Emissions of CO_2 and CH_4 from transportation sources for the proposed Project were quantified using CalEEMod. Because the CalEEMod computer program does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the California Climate Action Registry General Reporting Protocol (January 2009) direct emissions factors for mobile combustion (see Appendix D for calculations). Emission rates for N_2O emissions were based on the vehicle mix output generated by CalEEMod and the emission factors contained in the California Climate Action Registry General Reporting Protocol. The Project is based on a land use pattern that would co-locate residential and commercial uses within the Project Site, resulting in a reduction of vehicle trips. The estimate of total daily trips associated with the proposed Project was based on vehicle trip data provided in the traffic study prepared by Fehr & Peers (refer to Section 4.13, *Transportation and Circulation* and Appendix I), which includes a 13% mixed-use development (MXD) reduction in vehicle trips. The overall vehicle fleet mix used in the analysis is the default fleet mix for San Benito County developed by MBUAPCD and provided in the CalEEMod software. The Project may also include, as alternative to automobile travel for internal trips, golf carts or neighborhood electric vehicles. Golf carts can be electric or gas-powered, but would generally replace trips associated with automobiles, which result in higher GHG emissions than golf carts or neighborhood electric vehicles; therefore, while this analysis does not quantify emissions associated with golf carts or neighborhood electric vehicles to be conservative, the use of such vehicles would generally reduce GHG emissions, as compared to traditional automobile trips.

b. Project Impacts and Mitigation Measures.

Impact GHG-1 Development of the Project would generate additional GHG emissions beyond existing conditions due to construction activity and the Project's long-term operation. Total estimated GHG emissions would exceed the efficiency threshold. Therefore, this impact would be Class I, *significant and unavoidable*. [Threshold number 1]

As discussed above, GHG emissions for proposed buildout of the Project were estimated using CalEEMod. The following summarizes the Project's overall GHG emissions (see Appendix D for full CalEEMod worksheets prepared for the Air Quality Analysis). Tables 4.7-3 through 4.7-7 show emissions expected from the proposed Project.

Construction Emissions. Construction of the proposed Project would generate temporary GHG emissions primarily due to the operation of construction equipment and truck

trips. Construction activity is assumed to occur over a period of approximately 10 years (in five separate phases). Based on the CalEEMod results, construction activity for the Project would generate an estimated 7,589 MT of CO_2e units (as shown in Table 4.7-2). Amortized over a 50-year period (the assumed lifetime of the Project), construction of the proposed Project would generate an estimated 152MT of CO_2e per year. Construction assumptions used to calculate the emissions are shown in the CalEEMod output tables in Appendix D.

Table 4.7-2
Estimated Construction Emissions of Greenhouse Gases

Emission Source	Annual Emissions
Construction for Phase I	1,745 MT CO_2e
Construction for Phase II	1,762 MT CO_2e
Construction for Phase III	1,703 MT CO_2e
Construction for Phase IV	1,022 MT CO_2e
Construction for Phase V	1,357 MT CO_2e
Total (full Buildout – 5 total phases)	**7,589 MT CO_2e**
Amortized over 50 years	**152 MT CO_2e/year**

[1] *See Appendix D for calculations and for GHG emission factor assumptions using Annual results from CalEEMod 2013.2.2.*

On-Site Operational Emissions. Operational emissions from energy use (electricity and natural gas use) for the proposed Project were estimated using CalEEMod (see Appendix D for calculations). As discussed above, annual electricity and natural gas emissions were calculated using default values from the CEC sponsored CEUS and RASS studies which are built into the CalEEMod model. Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coating were calculated in CalEEMod based on standard emission rates from ARB, U.S. EPA, and air district supplied emission factor values (CalEEMod User's Guide, 2013). Emissions from waste generation were also calculated in CalEEMod based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User's Guide, 2013). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle). Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

Direct Emissions from Mobile Combustion. Emissions from vehicles driving to and from and within the Project Site were based on vehicle trip rates and trip lengths from the traffic impact analysis (Fehr & Peers, June 2014; also refer to Section 4.13, *Transportation and Circulation*). Emissions of CO_2 and CH_4 from transportation sources were quantified using CalEEMod. Because CalEEMod does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the California Climate Action Registry General Reporting Protocol (January 2009) direct emissions factors for mobile combustion (refer to Appendix D for calculations). Emission rates for N_2O emissions were based on the vehicle mix output generated by

CalEEMod and the emission factors found in the California Climate Action Registry General Reporting Protocol.

Combined Construction, Stationary and Mobile Source Emissions. Table 4.7-3 combines the construction, operational, and mobile GHG emissions associated with onsite development for the proposed Project. As described above, emissions associated with total construction activity (estimated at 7,589 MT of CO_2e for all five phases) are amortized over 50 years (the anticipated life of the Project).

Table 4.7-3
Combined Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions
Construction	152 MT CO_2e
Operational	
Area	308 MT CO_2e
Energy	4,472 MT CO_2e
Solid Waste	517 MT CO_2e
Water	370 MT CO_2e
Mobile	
CO_2 and CH_4	9,073 MT CO_2e
N_2O	506 MT CO_2e
Total	**15,399 MT CO_2e**
Service Population	2,620
Total / service population	**5.9 MT CO_2e**
Threshold	4.9 MT CO_2e/service population/year
Threshold Exceeded?	**YES**

Sources: See Appendix D for calculations and for GHG emission factor assumptions.

As shown in Table 4.7-3, the combined annual emissions associated with buildout of the Project would total **a**n estimated 15,399 MT of CO_2e per year. These emission projections indicate that the majority of the Project's GHG emissions are associated with vehicular travel (62%) and energy use (29%). As discussed above, the most appropriate GHG emissions threshold for the proposed Project is SLOAPCD's adopted efficiency threshold (4.9 MT CO_2e/service population/year). As shown in Table 4.7-3 the proposed Project would result in annual emissions that would exceed the efficiency threshold by 1.0 MT CO_2e/service population/year; therefore, this impact would be potentially significant.

As noted in Section 2.0, *Project Description,* in the event that Project wastewater cannot be conveyed to the City of Hollister's domestic wastewater treatment plant/water reclamation facility (DWWTP/WRF) for treatment and disposal, the Project applicants propose the construction of an optional on-site wastewater treatment plant (WWTP) within a portion of the neighborhood commercial area. Should the optional on-site WWTP be constructed, GHG emissions associated with increased electrical use of mechanical equipment (e.g. pumps) would

occur during the treatment, aeration, and pumping of wastewater. In addition, there would be two daily vehicle trips associated with two employees, and periodic vehicle trips (one per week) for inspections and bio-solids removal. Based on the size of the on-site WWTP (0.16 mgd per day) and emissions estimates from EPRI (2002), GHG emissions associated with energy consumption would increase by less than three percent over Project estimates, and would not be considered a significant increase source of GHG emissions based on established thresholds of significance. In addition, the use of locally treated wastewater for irrigation instead of imported water is likely to reduce GHG emissions associated with the production and conveyance of imported water.

Mitigation Measures. In order to quantify the total annual GHG emissions that would need to be reduced over the operational life of the Project, the threshold of 4.9 MT CO_2e/service population/year was multiplied by the service population of 2,620 (totaling 12,838 MT CO_2e) to determine the volume of bulk emissions that would be less than significant based on the 4.9 MT CO_2e/service population/year threshold. The difference between the proposed Project's annual emissions (15,399 MT CO_2e) and the bulk permissible emissions (12,838 MT CO_2e) is 2,561 MT CO_2e. Therefore, 2,561 MT CO_2e/year is the total volume of GHGs that the Project would need to eliminate or offset to reduce this impact to a less than significant level.

Mitigation Measure AQ-2(a) from Section 4.3, *Air Quality*, restricts fireplaces within the Project to natural gas (rather than wood). This mitigation measure would also reduce the area source GHG emissions from hearths from 288 MT CO_2e/year to 249 MT CO_2e/year, thereby reducing area emissions from 308 MT CO_2e/year to 270 MT CO_2e/year. The reduction in area source emissions would slightly reduce the total GHG emissions from the Project from 15,399 MT CO_2e/year to 15,360 MT CO_2e/year, but would not reduce the Project's GHG emissions below the 4.9 MT CO_2e/service population/year threshold. In order to reduce Project emissions below the threshold, an additional reduction of 2,522 MT CO_2e/year would need to be achieved. Therefore, Mitigation Measure GHG-1 shall apply to future development within the Project Site.

GHG-1 **GHG Reduction Plan.** Prior to initial grading permit issuance, the Project applicant shall develop and implement a Project GHG Reduction Plan, approved by the County, that documents a reduction in annual GHG emissions from the Project by a minimum of 2,522 MT CO_2e/year over the operational life of the Project. The GHG Reduction Plan shall include:

A. On-site GHG reduction measures designed to reduce GHG emissions on the Project Site. On-site GHG reduction measures shall be implemented by the Project applicants and shall be reflected on and incorporated into all applications for development within the Project Site. On-site GHG reduction measures may include, but are not be limited to, the following components:
   - Energy Use
     - On-site energy conservation policies in addition to those described in the Specific Plan Development Standards

  - Exceed adopted 2013 Title 24 energy requirements by a minimum of 10 percent through implementation of energy reduction measures, including:
    - Use locally made building materials for construction of the Project and associated infrastructure when such materials are locally available;
    - Use of materials which are resource efficient, recyclable, with long life cycles;
    - Install energy-reducing shading mechanisms for windows, porches, patios, walkways, etc.;
    - Install energy reducing day lighting systems (e.g. skylights, light shelves, transom windows);
    - Use of water efficient landscapes;
    - Use tankless water heaters or solar water heaters;
    - Use of low-energy interior lighting;
    - Use low-energy street lights and parking lot lights (i.e. sodium); and
    - Use of light colored water-based paint and roofing materials.
  - On-site renewable energy production, including wind-generated energy or installation of solar photovoltaic (PV) panels or other on-site renewable energy that generates a minimum of 30 percent of the Project's total energy demand
- Vehicle Trips (based on MBUAPCD Transportation Demand Management [TDM] measures)
  - Provide preferential carpool/vanpool parking spaces
  - Add a location for tour and shuttle buses to pick up passengers near the amenity center and assisted living facility (i.e. bus duck out for residents living on the Project Site), or other shuttle/mini bus service
  - Provide bicycle storage/parking facilities for on-site employees
  - Provide shower/locker facilities for on-site employees
  - Provide child care centers for on-site employees
  - Provide an on-site park-and-ride lot
  - Employ a transportation/rideshare coordinator
  - Implement a rideshare program for on-site residents and employees
  - Provide incentives to employees to rideshare or take public transportation
  - Implement compressed work schedules

The Project applicant shall be responsible for ensuring that the GHG Reduction Plan quantifies the emissions reduction achieved by all GHG reduction measures included in the GHG Reduction Plan. The GHG Reduction Plan shall include all necessary evidence to facilitate review of the emissions reductions measures and the total GHG emissions reduction achieved by the San Benito County Planning and Building Departments.

B. GHG/Carbon Offset Mechanism. The GHG emissions reduction achieved through implementation of on-site GHG reduction measures would depend on the specific mix of measures available for each development application within the Project. Because it is not yet possible to know with certainty which on-site GHG reduction measures would be feasibly incorporated into the Project, or to quantify the reduction in GHG emissions that these measures would achieve, on-site GHG reduction measures may not be sufficient to reduce Project GHG emissions by the required 2,522 MT CO_2e/year. If GHG emissions cannot be reduced below threshold levels through compliance with the Project GHG Reduction Plan described in Part A, Project applicants shall purchase a fair share of carbon offsets that meet approved offset protocols through the California Cap-and-Trade Program to reduce GHG emissions below threshold levels. Carbon offsets reduce GHG emissions globally through funding off-site projects that eliminate new GHG emissions and/or sequester existing GHGs in the atmosphere.

Plan Requirements and Timing. The GHG Reduction Plan shall be approved by San Benito County Planning and Building Departments prior to initial grading permit issuance. Applicable elements of the GHG Reduction Plan shall be reflected on development plans prior to permit approval. If GHG emissions cannot be reduced through compliance with such a plan, purchased carbon offsets shall be approved by Planning and Building staff prior to permit approval.

Emissions reductions from individual GHG reduction measures are quantifiable for the purpose of demonstrating compliance with Mitigation Measure GHG-1 using CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (August 2010), available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Depending on the specific mix of GHG reduction components available to a particular phase of the Project, sufficient on-site GHG emissions reductions may not be available to reduce GHG emissions by the required 2,522 MT CO_2e/year over the operational

life of the Project. Therefore, to further reduce Project GHG emissions, Project applicants would be required to purchase carbon offsets that meet approved offset protocols through the California Cap-and-Trade Program.

Significance After Mitigation. While implementation of Mitigation Measure GHG-1 would mitigate the GHG emissions associated with the proposed Project to the extent feasible, the offset program described in measure GHG-1 has not been vetted or approved by the County Board of Supervisors. In addition, the timing of the projects funded by the carbon offsets – and therefore the timing of the reduction in emissions – cannot be confirmed at the time of publication of this SEIR. Furthermore, because the specific mix of GHG reduction components have not yet been identified, sufficient on-site GHG emission reductions may not be available to reduce GHG emissions below the applicable threshold. Therefore, impacts would remain significant and unavoidable.

Impact GHG-2 The proposed Project would be generally consistent with the Climate Action Team GHG reduction strategies and the 2008 Attorney General Greenhouse Gas Reduction Measures. As a result, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Impacts would be Class III, *less than significant*. [Threshold number 2]

San Benito County has not adopted a Climate Action Plan or other GHG reduction plan. Applicable policies in the existing General Plan (1985) and the Draft 2035 General Plan Update are described in Section 4.7.1(e), above. AMBAG is currently preparing a regional Sustainable Communities Strategy designed to help the region achieve its SB 375 GHG emissions reduction target, thereby contributing to the overall GHG emissions reduction goals identified in AB 32; however, this document has not been published and therefore is not incorporated for purposes of this analysis.

CalEPA's Climate Action Team (CAT) published the 2006 CAT Report which includes GHG emissions reduction strategies intended for projects emitting less than 10,000 tons CO_2e/year. In addition, the California Attorney General's Office has developed Global Warming Measures (2008) and OPR's CEQA and Climate Change (CAPCOA, 2008) document includes greenhouse gas reduction measures intended to reduce GHG emissions in order to achieve statewide emissions reduction goals. All of these measures aim to curb the GHG emissions through suggestions pertaining to land use, transportation, renewable energy, and energy efficiency. Several of these actions are already required by California regulations, such as:

- AB 1493 (Pavley) requires the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks.
- In 2004, CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling.
- The Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989) established a 50% waste diversion mandate for California.

- Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).
- California's Renewable Portfolio Standard (RPS), established in 2002, requires that all load serving entities achieve a goal of 33 percent of retail electricity sales from renewable energy sources by 2020, within certain cost constraints.
- Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, as compared with 2003 levels.

The Project would be required to comply with these existing State regulations, which have been adopted to achieve the overall GHG emissions reduction goals identified in AB 32.

In addition, as described in Section 4.7.1(e), the existing General Plan (1985) and Draft 2035 General Plan Update include several goals and policies that encourage energy and water conservation techniques and energy efficiency in all new building design, orientation and construction, and establish development and construction standards which encourage energy conservation in residential uses. Consistent with the above-referenced General Plan goals and policies, the Project would be required to incorporate energy-efficient features including roof colors and materials that meet or exceed Energy Star requirements to reduce the heat island effect; energy and water-efficient appliances, fixtures, lighting, and windows that meet or exceed state energy performance standards; high-efficient air conditioners; and Energy Star bath fans in each home. In addition, the Project includes Design Guidelines that encourage the use of energy-efficient windows, rooftop solar and other small-scale renewable energy sources, Energy Star qualified (or equivalent rating system) models of mechanical equipment, and energy-efficient, low voltage exterior lighting.

The existing San Benito County General Plan and the Draft 2035 General Plan Update include goals and policies related to GHG reductions throughout various elements. As discussed above, the Project would be required to implement a number of energy conservation measures and use renewable energy sources to reduce GHG emissions generated within the Project Site. Implementation of the proposed Project's energy conservation measures would be consistent with the energy conservation goals and policies within the existing General Plan and Draft 2035 General Plan Update Land Use, Housing, and Natural and Cultural Resources Elements. Due to the Project's close proximity to local and regional transit lines (e.g., San Benito County Express, and City of Hollister bus system), future residents and users of the Project would have various alternative transportation options (effectively reducing vehicle trips). In addition, the San Benito Council of Governments (SBCOG) provides ridesharing facilities and park-and-ride lot facilities throughout the County that Project residents and users would be able to access. As such, the Project would comply with the above-referenced General Plan goals and policies, and result in indirect GHG emission reductions consistent with the County's GHG reduction goals and targets.

As described in Section 4.7.1(e), MBUAPCD has not established significance thresholds for GHG emissions, nor has MBUAPCD adopted specific goals or policies designed to reduce GHG emissions; however, development on the Project Site would be required to comply with applicable state regulations and MBUAPCD AQMP Plans and policies intended to reduce

criteria pollutant emissions (refer to Section 4.3, *Air Quality*, for additional detail regarding adopted MBUAPCD Plans) which would also reduce GHG emissions from development on the Project Site. Because the Project would be required to comply with State regulations adopted to achieve the overall GHG emissions reduction goals identified in AB 32, as well as applicable state regulations and MBUAPCD AQMP Plans and policies to reduce criteria pollutant emissions, and would also implement adopted County goals and policies that encourage energy and water conservation techniques and energy efficiency in all new building design, orientation and construction, and establish development and construction standards which encourage energy conservation in residential uses, the Project would not conflict with any applicable plan, policy or regulation intended to reduce GHG emissions. Therefore, this impact would be less than significant.

Mitigation Measures. No mitigation would be required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

c. Cumulative Impacts. GHG and climate change are by definition cumulative impacts, as they affect the accumulation of greenhouse gases in the atmosphere. Refer to Impact GHG-1 and Impact GHG-2 for discussion of climate change and GHG emissions. Projects that would not exceed, or would be mitigated below the thresholds of significance discussed under Impact GHG-1 and Impact GHG-2 are therefore considered to have a less than significant cumulative impact. As indicated above in Impact GHG-1, GHG emissions associated with the proposed Project would be significant and unavoidable, and the Project's impacts are therefore also cumulatively significant and unavoidable.