Meadowood Global Climate Change Analysis County of San Diego GPA04-002, SPA04-001, R04-004, VTM 5354RPL², S04-005, S04-006, S04-007 and ER No. 04-02-004

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TABLE OF CONTENTS

TABLES

ATTACHMENTS

TERMS AND ACRONYMS

ADT	Average Daily Trips
AB 32	Assembly Bill 32: California Global Warming Solutions Act
AB 1493	Assembly Bill 1493: California Vehicle Greenhouse Gas Standards
BAU	business as usual
CAFE	Corporate Average Fuel Economy Standards
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CCAP	Climate Change Action Plan
CH_4	Methane
CO_2	Carbon dioxide
CO_2 Eq	Equivalent Carbon Dioxide
EO	Executive Order
GHG	Greenhouse gas
GWP	Global warming potential
HFC	hydrofluorocarbons
I-15	Interstate 15
kWh	kilowatt hours
LCFS	Low Carbon Fuel Standard
MWD	Municipal Water District
MWh	Megawatt hours
N_2O	Nitrous oxide
LCFS	Low Carbon Fuel Standard
Pavley	synonymous with AB 1493, see above
mpg	miles per gallon
ODS	Ozone depleting substances
PFC	perfluorocarbons
SF_6	sulfur hexafluoride
Title 24	California Code of Regulations, Title 24, Part 6, California Energy Efficiency Standards for Residential and Nonresidential Buildings
VMT	Vehicle miles traveled
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
WARM	Waste Reduction Model
° F	degrees Fahrenheit

EXECUTIVE SUMMARY

This report evaluates the potential global climate change impacts associated with the Meadowood Project (Proposed Project). An assessment was made to estimate the total greenhouse gas (GHG) emissions that would be emitted as a result of construction and operation of the Proposed Project given its GHG-reducing design features. This result was compared to a parallel estimate of construction and operational GHG emissions for a business-as-usual (BAU) project. The cConstruction sources of GHG emissions that were calculated included heavy construction equipment, worker Vehicle Miles Traveled (VMT), and water use. The calculated oOperational sources of GHG emissions sources included energy, transportation, and solid waste. Estimates of these emissions were calculated for both the Proposed Project and the BAU scenario for the year 2020.

A comparison of the Proposed Project relative to BAU was evaluated for significance based on the statewide 2020 goals contained in Assembly Bill (AB) 32 and Executive Order (EO) S-3-05; and in the regional San Diego goal estimated by the San Diego Energy Policy Initiative Center (EPIC) as necessary to meet the statewide/AB 32 goals. The San Diego EPIC regional goal directs that development projects must reduce their GHG emissions by 33 percent compared to BAU.

The following analysis demonstrates that the Proposed Project incorporates project design features that substantially reduce its demands for energy and water use; resulting in GHG emissions 34% below BAU GHG emissions. Specifically, the Proposed Project would design and construct all buildings to achieve 30 percent greater energy efficiency than is required in the current 2008 Title 24 Energy Efficiency Standards; and would design and construct all buildings to achieve a minimum 25 percent greater water conservation/efficiency than is required in the current 2007 plumbing code.

~~While there is no set threshold for GHG emissions, given the State of California's mandated goal of reducing statewide GHG emissions to 1990 levels, the incremental increase of GHG emissions resulting from operation of the Proposed Project may be considered cumulatively significant.~~

~~The report, *The California Environmental Quality Act; Addressing Global Warming Impacts at the Local Agency Level* (State of California 2008) provides a list of measures appropriate for the Proposed Project that minimizes the significant effect of global climate change.~~The Proposed Project as currently envisioned thus incorporates ~~many of these measures~~design features adequate to reduce BAU emissions to target levels. W~~Thus, w~~ith the implementation of these design features~~measures~~, global climate change impacts from the Proposed Project would be reduced to less than significant.

1.0 INTRODUCTION

1.1 Purpose of the Report & Regulatory Background

1.1.1 ~~Regulatory Framework~~Purpose of the Report

The purpose of this report is to evaluate the significance of the Proposed Project's contribution of GHG emissions to cumulative statewide GHG emissions and GHG emissions reduction goals.

1.1.2 ~~Greenhouse Gases~~Understanding Global Climate Change

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. The earth's climate is in a state of constant flux, with periodic warming and cooling cycles. Extreme periods of cooling are termed "ice ages," which may then be followed by extended periods of warmth. For most of the earth's geologic history, these periods of warming and cooling have been the result of many complicated, interacting natural factors that include volcanic eruptions which spew gases and particles (dust) into the atmosphere, the amount of water, vegetation, and ice covering the earth's surface, subtle changes in the earth's orbit, and the amount of energy released by the sun (sun cycles). However, since the beginning of the Industrial Revolution around 1750, the average temperature of the

earth has been increasing at a rate that is faster than can be explained by natural climate cycles alone.

With the Industrial Revolution came an increase in the combustion of carbon-based fuels such as wood, coal, oil, and biomass~~"biofuels."~~ Industrial processes have also created emissions of substances that are not found in nature. This in turn has led to a marked increase in the emissions of gases that have been shown to influence the world's climate. These "greenhouse" gases~~,~~ (GHGs)~~,~~ influence the amount of heat that is trapped in the earth's atmosphere. Because recently observed increased concentrations of GHGs in the atmosphere are related to increased emissions resulting from human activity, the current cycle of "global warming" is generally believed to be largely due to human activity. Of late, the issue of ~~"~~global warming or global climate change~~"~~ has arguably become the most important and widely debated environmental issue in the United States and the world. Because climate change is caused by the collective of human actions taking place throughout the world, it is quintessentially a cumulative issue.

1.1.2.1 Greenhouse Gases

There are numerous GHGs, both naturally occurring and artificial. Table 1 summarizes some of the most common.

TABLE 1
GLOBAL WARMING POTENTIALS (GWP) AND ATMOSPHERIC LIFETIMES (YEARS)

Gas	Atmospheric Lifetime (Years)	100-year GWP[a]
Carbon Dioxide (CO_2)	50-200	1
Methane (CH_4)[b]	12±3	21
Nitrous oxide (N_20)	120	310
HFC-23	264	11,700
HFC-125	32.6	2,800
HFC-134a	14.6	1,300
HFC-143a	48.3	3,800
HFC-152a	1.5	140
HFC-227ea	36.5	2,900
HFC-236fa	209	6,300
HFC-4310mee	17.1	1,300
CF_4	50,000	6,500
C_2F_6	10,000	9,200
C_4F_{10}	2,600	7,000
C_6F_{14}	3,200	7,400
SF_6	3,200	23,900

SOURCE: U.S. EPA 2002.

[a] GWPs used here are calculated over 100-year time horizon.

[b] The methane GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

Of the gases listed in Table 1, carbon dioxide, methane, and nitrous oxide are produced by both natural and anthropogenic (human) sources. These are the GHGs that would be emitted by the Proposed Project. The remaining gases (hydrofluorocarbons [HFCs; such

as HFC-23], perfluorocarbons [PFCs; such as CF_4], and sulfur hexafluoride [SF_6]), are the result of human processes and are used in specific applications and industries not relevant to the Proposed Project.

The potential of a gas to trap heat and warm the atmosphere is measured by its global warming potential (GWP). GHG either breakdown or are absorbed over time. Thus, the potential of a gas to contribute to global warming is limited by the time it is in the atmosphere, its "atmospheric lifetime." To account for these effects, GWPs are calculated over a 100-year time horizon (U.S. EPA 2002). Because of its relative abundance in the atmosphere and its relatively long atmospheric lifetime, carbon dioxide has been designated the reference gas for comparing GWPs. Thus, the 100-year GWP of CO_2 is equal to one (see Table 1).

1.1.3 Regulatory Framework

An increase in the earth's temperature is expected to have wide ranging effects on social and natural environments all over the globe, with numerous implications of direct importance to the U.S. and California. Hence, a number of international, national and state plans and regulations have been developed to address climate change issues.

1.1.3.1 International

The Coordinating Committee on the Ozone Layer was established by the United Nations Environment Program (UNEP) in 1977, and UNEP's Governing Council adopted the World Plan of Action on the Ozone Layer. Continuing efforts led to the signing in 1985 of the Vienna Convention on the Protection of the Ozone Layer. This led to the creation of the Montreal Protocol on Substances That Deplete the Ozone Layer (Montreal Protocol), an international treaty designed to protect the stratospheric ozone layer by phasing out production of ozone depleting substances (ODSs). The treaty was adopted on September 16, 1987, and went into force on January 1, 1989; and has been revised numerous times since, most recently in 1999.

Due to more general concerns about pollutants in the upper atmosphere and affects on climate change, the World Meteorological Organization and the UNEP established the Intergovernmental Panel on Climate Change in 1988. Similar to the events that led to the Montreal Protocol, to address growing concern about global climate change, 191 countries, including the United States, joined an international treaty known as the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC recognizes that the global climate is a shared resource that can be affected by industrial and other emissions of greenhouses gases, and sets an overall framework for intergovernmental efforts to tackle the challenges posed by global climate change. Under this treaty, 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. UNFCCC entered into force on March 21, 1994. However, this treaty generally lacked powerful, legally binding measures. This led to the development of the Kyoto Protocol.

The Kyoto Protocol was adopted in December 1997. While the 1997 Kyoto Protocol shares the UNFCCC's objective, principles, and institutions, it significantly strengthens

the UNFCCC by committing industrialized countries to individual, legally binding targets to limit or reduce their GHG emissions. By March 1994, 84 countries including the U.S. had signed the Kyoto Protocol. However, oOnly parties to the UNFCCC that have also become Parties to the Protocol are bound by the Protocol's commitments. Parties become Parties to the Protocol by either ratifying, accepting, approving, or acceding to it. Because of the complexity of the negotiations and uncertainty associated with the rules or how they would operate, several of the signing countries, including the U.S., have not ratified the Kyoto Protocol, despite several rounds of negotiations including the latest in 2009 in Copenhagen.

1.1.3.2 National

Adopted in 1993, tThe U.S. developed theClimate Change Action Plan (CCAP) . The CCAP consists of voluntary actionsinitiatives that involve to reduce all significant GHGs from all economic sectors and aim at reducing all significant GHGs. The CCAP, backed by federal funding, cultivates cooperative partnerships between the government and the private sector to establish flexible and cost-effective ways to reduce GHG emissions within each sector. The CCAP encourages investments in new technologies, but also relies on previous actions and programs focused on saving energy, reducing transportation emissions, improving forestry management, and reducing waste and reducing emissions.

In 2002, the U.S. set a goal to reduce its GHG Emissions Intensity (the ratio of GHG emissions to economic output) by 18 percent by 2012 through various reduction programs, including those identified in the CCAP. New programs included the Energy Star program which labels energy efficient appliances and products; the Green Power Partnership which promotes replacing electricity consumption with green (i.e., renewable) energy sources; the Climate VISION Partnership and Climate Leaders programs which involve actions to reduce GHG emissions at large corporations and major industries, including electric utilities, petroleum refineries, automobile manufactures, chemical manufacture and so on.

With regard to the transportation sector, the national Corporate Average Fuel Economy (CAFE) standards determine the fuel efficiency of certain vehicle classes in the U.S. After no changes since 1990, in 2007 the CAFE standards were increased for new light-duty vehicles to 35 miles per gallon (mpg) by 2020. In May 2009, President Obama announced plans to increase these CAFE standards to 35.5 mpg by 2016. With improved gas mileage, fewer gallons of transportation fuel would be combusted to travel the same distance, thereby reducing nationwide GHG emissions associated with vehicle travel.

1.1.3.3 State

The State of California has passed a number of policies and regulations that are either directly or indirectly related to GHG emissions. Only those most relevant to land use development projects are included in this discussion.

Executive Order (E0) S-3-05, signed by Governor Schwarzenegger on June 1, 2005, established the following GHG emission reduction targets for the state of California:

- by 2010, reduce GHG emissions to 2000 levels;

- by 2020 reduce GHG emissions to 1990 levels;
- by 2050 reduce GHG emissions to 80 percent below 1990 levels.

~~This executive order also directs the secretary of the California Environmental Protection Agency to oversee the efforts made to reach these targets, and to prepare biannual reports on the progress made toward meeting the targets and on the impacts to California related to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. With regard to impacts, the report shall also prepare and report on mitigation and adaptation plans to combat the impacts.~~

In response to E~~xecutive Order~~ S-3-05, the California legislature passed Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," ~~which was signed by the governor on September 27,~~in 2006. It required~~s~~ the California Air Resources Board (CARB) to adopt rules and regulations that would reduce statewide GHG emissions to 1990 levels by 2020. In order to assess the scope of the reductions needed to return to 1990 emissions levels, CARB first estimated 2020 business-as-usual (BAU) GHG emissions. These are the GHG emissions that would be expected to occur in the absence of any state GHG reduction measures. After estimating that statewide 2020 BAU GHG emissions would be 596 metric tons, CARB then developed a Scoping Plan that identified measures to reduce BAU emissions by approximately 174 metric tons by 2020. Table 2 provides a summary of the CARB Scoping Plan reduction measures. As shown, major reductions are to accrue from measures affecting energy and transportation (particularly on-road vehicles).

With regard to energy use, the California Code of Regulations, Title 24, Part 6 is the California Energy Efficiency Standards for Residential and Nonresidential Residential (also known as the California Energy Code). This code, originally enacted in 1978 ~~in response to legislative mandates~~, establishes energy efficiency standards for residential and non-residential buildings in order to reduce California's energy consumption. The Code is updated periodically to incorporate and consider new energy efficiency technologies and methodologies as they become available. The most recent amendments to the Code are dated ~~September 11,~~ 2008, hence "2008 Title 24" but became effective January 1, 2010~~6~~. The current/2008 Title 24 requires energy savings of 15-35 percent above the former 2005 Title 24. With 2008 Title 24, residential buildings must achieve a minimum 15 percent reduction in their combined space heating, cooling and water heating energy compared to the 2005 Title 24 standards. Incentives in the form of rebates and tax breaks are provided on a sliding scale for buildings achieving energy efficiency above this minimum 15 percent reduction. The reference to 2005 Title 24 is relevant in that many of the State's long-term energy and GHG reduction goals identify energy saving targets relative to 2005 Title 24. By reducing California's energy consumption~~s~~, emissions of GHGs may also be reduced.

Part 11 of the California Code of Regulations, Title 24, is the California Green Building Standards Code, referred to as CALGreen. This code was added to Title 24 in 2009 as a voluntary requirement. The 2010 version of CALGreen will take effect January 2011 and will institute mandatory minimum environmental performance standards for all buildings. Relevant to GHG emissions reductions, it requires a minimum 20% reduction in potable water use and provides incentives for green building design which could reduce energy demand and resulting GHG emissions associated with electricity generation.

With regard to public utilities/electricity generation, the CARB Scoping Plan identifies two key GHG reduction measures, the Renewables Portfolio Standard (RPS) which promotes diversification of the state's electricity supply and requires a 33 percent renewable energy mix statewide by 2020, and the Million Solar Roofs Program (MSRP) which requires publicly owned utilities to adopt, implement and finance solar incentive programs to lower the cost of solar systems. Combined, CARB estimates that full achievement of the RPS and MSRP would decrease statewide GHG emissions by 13% by 2020 (see Table 2).

With regard to transportation GHG emissions, California Assembly Bill (AB)1493 (also referred to as Pavley or the California Light-Duty Vehicle Greenhouse Gas Standards) was enacted on July 22, 2002. It required ~~the California Air Resources Board (~~CARB~~)~~ to develop and adopt regulations to lower GHG emissions from passenger vehicles and light duty trucks to the maximum extent technologically feasible, beginning with the 2009 model year. CARB adopted regulations in 2004 but due to litigation and delays from the U.S. EPA was not granted authority to proceed until June 2009. With this action, it is expected that the new regulations (Pavley I and II) will reduce GHG emissions from California passenger vehicles by about 18 percent statewide (see Table 2). These reductions are to come from improved vehicle technologies such as small engines with superchargers, continuously variable transmissions, and hybrid electric drives.~~that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB will apply to 2009 and later model year vehicles.~~

Another key vehicle emission reduction measure identified in the CARB Scoping Plan is the Low Carbon Fuel Standard (LCFS). Signed as E~~xecutive Order~~ S-01-07~~, signed~~ by Governor Schwarzenegger on January 18, 2007, it directs that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. ~~It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs the CARB to determine if a LCFS can be adopted as a discrete early action measure pursuant to AB 32. [The~~ CARB approved the LCFS as a discrete early action item~~ with a regulation to be adopted and implemented by 2010 at its June 2007 hearing.]~~ EO S-01-07 also instructs the California ~~Environmental Protection Agency~~EPA to coordinate activities between the University of California, the California Energy Commission, and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target.

Also identified in the CARB Scoping Plan to address vehicle emissions is the Regional Transportation-Related GHG Targets measure. This measure identifies policies to reduce transportation emissions through changes in future land use patterns and community design, as well as through improvements in public transportation, all of which are intended to reduce VMT. By reducing VMT, vehicle GHG emissions would be reduced. Improved planning and the resulting development are seen as essential for meeting the AB 32/EO S-3-05 2050 emissions target (CARB 2008b p. 20). This measure is linked to Senate Bill (SB) 375 which directs that regional emissions targets be established for passenger vehicles by Metro Planning Organizations (MPOs) in their regional transportation plans as Sustainable Communities Strategy (SCS). While San Diego regional MPO, SANDAG, has not yet set emissions target approved by CARB, the CARB expects that this measure will reduce transportation-related GHG emissions by about 5 million metric tons or three percent of the total needed statewide reductions.

1.2 Project Location and Description

The Proposed Project is located to the north of State Route 76, and east of Interstate 15 (I-15) in the county of San Diego. The parcels are situated between several planned projects: Palomar College Campus, Campus Park and Campus Park West. South and east is the approved Rosemary's Mountain Rock Quarry. Located to the north and east is land that is largely undeveloped and consists of citrus and avocado orchards and natural open space.

The Proposed Project entails construction of 844 single- and multi-family homes, a school, park, and open space. Figure 1 shows the regional location of the Proposed Project. Figure 2 shows the project boundary plotted on an aerial photograph of the project vicinity. Figure 3 shows the site plan for the Proposed Project.

1.2.1 California Green Builder Program

The applicant would design and construct the Proposed Project in accordance with the residential standards of the Building Industry Association's California Green Builder (CGB) program. The CGB program sets goals for significant improvements in energy efficiency, water conservation, wood conservation, on-site waste recycling, and indoor air quality. It is a voluntary program recognized by the California Energy Commission (CEC) as one of several green building performance rating systems available to potentially lower GHG emissions from buildings (CARB 2008c).

1.2.1.1 Energy Efficiency

In exceedance of the minimum requirements of the CGB program, the Proposed Project shall surpass the current 2008 Title 24 California Energy Code's residential and non-residential energy efficiency standards by 30 percent. It would accomplish this through improved HVAC systems and duct seals; enhanced ceiling, attic and wall insulation; EnergyStar appliances; high-efficiency water heaters; energy-efficient three-coat stucco exteriors; energy-efficient lighting; and high-efficiency window glazing. These energy features would undergo independent third party inspection and diagnostics as part of the CGB verification and commissioning process.

1.2.1.2 Water Conservation

By featuring advanced plumbing systems such as parallel hot water piping or hot water recirculation systems, and fixtures such as ultra-low flow toilets, water-saving showerheads and kitchen faucets, and buyer-optional high-efficiency clothes washers, the Proposed Project would exceed water efficiency requirements in the current plumbing code (Part 5 of the Title 24, California Building Standards Code), by a minimum of 25 percent. In accordance with CGB criteria, the 25 percent reduction in water use shall be demonstrated by verifying each plumbing fixture and fitting meets the reduced flow rate or by calculating a 25 percent reduction in the building water use baseline.

In addition to indoor water use conservation features, the Proposed Project's outdoor landscaping plan maximizes drought-tolerant plants and incorporates weather-based irrigation controllers, multi-programmable irrigation clocks, and a high-efficiency drip

irrigation system. At the time of final inspection, a manual shall be placed in each building that includes, among other things, information about water conservation.

1.2.1.3 Materials Use and Waste Reduction

In accordance with CGB criteria and state and local laws, at least 50 percent of on-site construction waste and ongoing operational waste would be diverted from landfills through reuse and recycling. To further minimize waste, the Proposed Project would incorporate recycled materials for flooring, and certified sustainable wood products and other recycled or rapidly renewable building materials where possible. Areas for storage and collection of recyclables and yard waste would be provided for each residence.

1.2.1.4 Pollutant Control and Heat Island Reduction

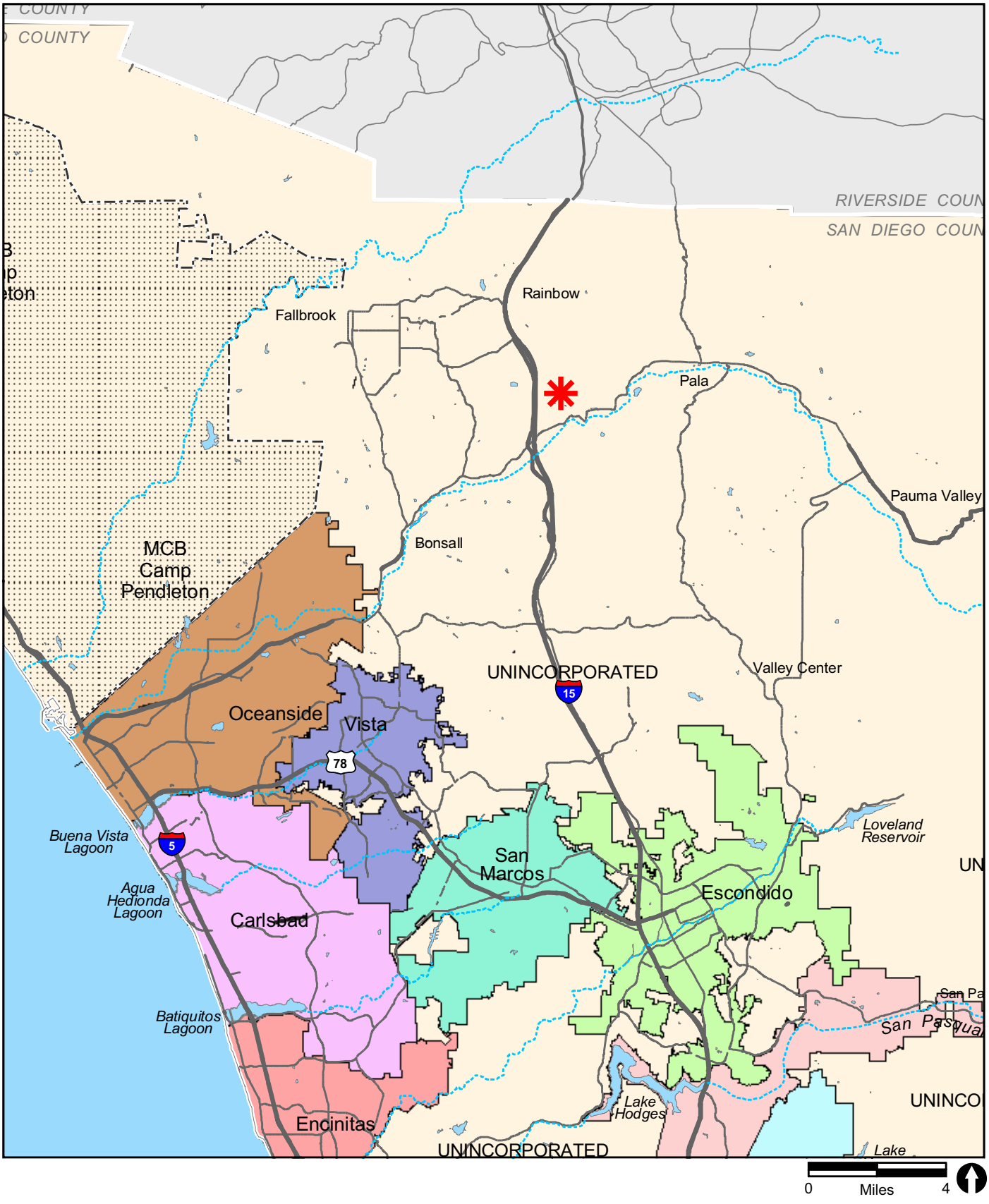
To maximize shade and reduce heat island effects, the landscape plan includes strategic location of deciduous trees and other vegetation and shading structures. Impervious surfaces, including paved parking areas, would also be minimized and pervious pavers used instead where practical. No CFC-based refrigerants would be used, and interior finishes, adhesives, sealants, paints and coatings, and carpet systems would be low in VOCs (volatile organic compounds), and meet the testing and product requirements of one or more nationally recognized green product labeling programs. Compliance with these requirements of the CGB program shall be verified through documentation.

2.0 POTENTIAL CLIMATE CHANGE IMPACTS ON PROJECT SITE

The increase in the earth's temperature is expected to have wide ranging effects on the environment. Although global climate change is anticipated to affect all areas of the globe, there are numerous implications of direct importance to California. Statewide average temperatures are anticipated to increase by between 3 and 10.5 degrees Fahrenheit (° F) by 2100. Some climate models indicate that this warming may be greater in the summer than in the winter. This could result in widespread adverse impacts to ecosystem health, agricultural production, water use and supply, and energy demand. Increased temperatures could reduce the Sierra Nevada snowpack and put additional strain on the region's water supply. In addition, increased temperatures would be conducive to the formation of air pollutants resulting in poor air quality.

The anticipated consequences of global climate change have the potential to result in adverse impacts to the Proposed Project. Future residents of the Proposed Project could be exposed to increased risk of dehydration, heat stroke, heat exhaustion, heart attack, stroke, and respiratory disease. However, these risks would be no different from those experienced by the San Diego region as a whole. Increased temperatures would result in more frequent use of air conditioning that would increase energy costs to residents and that could put a strain on the area's energy supplies. Because the Proposed Project is located inland well above sea level, no impacts related to sea level rise are anticipated.

It is also important to note that even if GHG emissions were to be eliminated or dramatically reduced, due to the lifespan of GHGs in the atmosphere it is projected that the effect of those emissions would continue to affect global climate for centuries.



Project location

FIGURE 1

Regional Location

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Project Boundary

FIGURE 2

Aerial Photograph of Project

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Project Boundary

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FIGURE 3

Site Plan

3.0 SIGNIFICANCE CRITERIA & ANALYSIS METHODOLOGIES

3.1 Guidelines for Determining Significance

Based on Appendix G of the California Environmental Quality Act Guidelines, the County of San Diego has determined that a proposed project would have significant climate change impacts if it would:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? ~~Impede the implementation of AB 32, the California Global Warming Solutions Act.~~

~~This guideline~~These thresholds address~~es~~ the potential cumulative impacts that an individual project's GHG emissions could have on ~~climate change~~greenhouse gas emissions. As identified in Section 1.1.1, AB 32, and the related EO S-3-05, established the statewide GHG emission target of achieving 1990 GHG emissions levels by 2020. AB 32 also directed CARB to identify the GHG reduction measures needed to reduce 2020 business-as-usual (BAU) emissions to the target 1990 emissions level. In response, CARB developed a BAU 2020 Forecast of statewide GHG emissions that would occur in the absence of AB 32's mandated reductions, based on growth factors applied to past and present GHG emissions inventories (CARB 2008a). CARB then developed a Climate Change Scoping Plan which identified the GHG reduction measures necessary to reduce BAU 2020 emissions to 1990 levels, an approximate 30% reduction across all sectors statewide (CARB 2008b).

A more specific regional GHG inventory and projection of countywide emissions was prepared by the University of San Diego School of Law Energy Policy Initiative Center that took into account the unique characteristics of the San Diego region. Based on this inventory and 2020 emissions projections, it was concluded that countywide GHG emissions needed to be reduced by 33 percent below BAU in order to achieve 1990 emissions levels by 2020 (EPIC 2008).

Therefore, to demonstrate that the Proposed Project would not impede the implementation of AB 32, the Proposed Project must demonstrate how its 2020 GHG emissions would be reduced to 33 percent below projected BAU 2020 emissions. BAU 2020 emissions are generally defined as the emissions that would have occurred in the absence of AB 32's mandated reductions. More specific to project development proposals, BAU emissions are defined as those that would be generated through development compliant with the 2005 Title 24 standards, water conservation and waste diversion standards established in current regulations, and vehicle fleet characteristics reflecting existing engine and fuel technologies. Thus, BAU emissions do not account for recent updates to the Title 24 energy standards, pending updates to the plumbing code, pending implementation of the California Green Building Code, nor recent regulations mandating near-future improvements in vehicle fuel mileage, GHG emissions reductions and low-carbon vehicle fuels.

~~There are currently no published thresholds or recommended methodologies for determining the significance of a project's potential contribution to global climate change in documents prepared pursuant to the California Environmental Quality Act (CEQA), and no uniformly accepted approach has been developed for assessing a project's potential impacts relative to global climate change.~~

~~CARB has prepared *Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act* (State of California 2008). This draft document is intended as a resource, not a guidance document.~~

~~The major emission sub-sources for residential and commercial uses include energy use, transportation, water use, waste, and construction. CARB has identified the California Energy Commission's (CEC) Tier II Energy Efficiency goals as an appropriate performance standard for energy use. Currently, the CEC recommends a Tier II goal for residential and commercial projects of a 30 percent reduction in building combined space heating, cooling, and water heating energy compared to Title 24 standards. These standards are consistent with what is needed to meet the state's goal of zero net energy buildings and are continuously updated to reflect energy efficiency best practices. For the purposes of this analysis, a 30 percent reduction over Title 24 standards was used as a significance threshold. CARB intends to compile performance standards for the remaining emission sub-sources. The analysis in this report includes an emissions assessment and a qualitative impact assessment based on recommendations in the CARB report, as well as a discussion of measures that have been incorporated into the project design that would reduce GHG emissions.~~

3.2 Methodology & Assumptions

In order to evaluate whether or not the Proposed Project would impede implementation of AB 32 by not reducing its GHG emissions by a minimum of 33% compared to BAU 2020 emissions, a comparative assessment of estimated project-specific BAU and proposed project emissions was conducted. Thus, in Section 4.0 emissions for a BAU "project-equivalent" are calculated, and in Section 5.0 the GHG emissions for the Proposed Project are calculated and compared to the BAU estimates. In both scenarios GHG emissions are estimated for the year 2020. In the estimates of BAU GHG emissions, GHGs were calculated for the proposed land use quantities (i.e., dwelling units and square footage) and associated traffic. In the estimates of the Proposed Project GHG emissions, GHGs were also calculated for the proposed land use quantities (i.e., dwelling units and square footage) and associated traffic, but included reductions due to energy- and water-saving design features that surpass existing code requirements. The Proposed Project estimates of vehicle GHG emissions also included reductions due to State regulations mandating improvements in automobile and fuel manufacture.

For both the BAU and Proposed Project scenarios, GHG emissions were calculated for energy use, transportation, water use, waste, and construction using several sources. Emissions of CO_2 due to construction ~~of the Proposed Project~~ were calculated using the URBEMIS 2007 computer program. It was assumed that construction would begin in January 2012 and last until year 2025.

To calculate GHG emissions due to operation ~~of the Proposed Project~~, the estimated ~~average~~ electricity, natural gas, and water usage quantities were multiplied by GHG emission factors published by the U.S. EPA and the U.S. DOE. Vehicle emissions were estimated using the GHG emission factors developed by the Bay Area Air Quality Management District (due to the absence of any GHG emission factors developed by the South Coast AQMD) and the total VMT per day estimated by the URBEMIS 2007 computer program for the Proposed Project. The EPA Waste Reduction Model ([WARM]; U.S. EPA 2008) was used to calculate the GHG emissions due to solid waste generat~~ed by the Proposed Project~~ion. ~~Each of these~~The GHG emission factors used in these calculations are summarized in Table 3 below.

TABLE 3
GHG EMISSION FACTORS

Gas	Vehicle Emission Factors (pounds/gallon)[1]	Electricity Generation Emission Factors (pounds/MWh)[2,3]	Natural Gas Combustion Emission Factors (pound/million cubic ft)[4]
Carbon Dioxide	19.564	1,340	120,000
Methane	0.00055	0.0111	2.3
Nitrous Oxide	0.0002	0.0192	2.2

[1]SOURCE: BAAQMD 2006.
[2]SOURCE: U.S. DOE 2002.
[3]Emissions associated with water use are calculated from the embodied energy in a gallon of water multiplied by the same GHG emission factors for electricity generation.
[4]SOURCE: U.S. EPA 1998.

As discussed above in Section 1.1.2, the three primary GHGs of CO_2, CH_4, and N_2O have varying amounts of GWP: 1, 21, and 310, respectively. Estimates of the emissions of these GHGs are thus multiplied by their respective GWPs and summed to express GHG emissions in terms of total metric tons of carbon dioxide equivalent or CO_2 Eq. (Note, this value is also abbreviated as $MTCO_sE$ in other documents pertaining to GHG estimates.)

4.0 BAU GREENHOUSE GAS INVENTORY

A~~n~~ BAU GHG assessment was made to estimate the total GHG emissions that would be emitted as a result of construction and operation of the Proposed Project under BAU; that is, without any reductions associated with project design features or state measures. Specifically, BAU is defined as development compliant with the building energy efficiency standards established in the 2005 Title 24 energy code (the code in effect at the time CARB's BAU 2020 forecast was made), water conservation and waste diversion standards established in current regulations, and existing vehicle engine and fuel technologies.

~~Construction sources of GHG emissions include heavy construction equipment, worker VMT, and water use. Operational sources of GHG emissions include energy, transportation, and solid waste. The three primary GHGs that would be emitted by the Proposed Project are CO_2, CH_4, and N_2O. As discussed above, these GHGs have varying amounts of GWP. As shown in Table 1, the 100-year GWP for CO_2, CH_4, and N_2O are 1, 21, and 310, respectively. GHG emission factors are summarized in Table 2.~~

TABLE 24
CARB SCOPING PLAN RECOMMENDED GHG REDUCTION MEASURES

Recommended Reduction Measures	Reductions Counted Towards 2020 Target In $MMTCO_2E$ (% subtotal)((% total)) [2]
ESTIMATED REDUCTIONS RESULTING FROM THE COMBINATION OF CAPPED SECTORS AND COMPLEMENTARY MEASURES	**146.7**
California Light-Duty Vehicle Greenhouse Gas Standards • Implement Pavley Standards • Develop Pavley II light-duty vehicle standards	31.7 (22%)((18%))
Energy Efficiency • Building/appliance efficiency, new programs, etc. • Increase CHP generation by 30,000 GWh • Solar Water Heating (AB 1470 goal)	26.3 (18%)((15%))
Renewables Portfolio Standard (33% by 2020)	21.3 (14%)((12%))
Low Carbon Fuel Standard	15 (10%)((9%))
Regional Transportation-Related GHG Targets[1]	5 (4%)((3%))
Vehicle Efficiency Measures	4.5 (3%)((3%))
Goods Movement • Ship Electrification at Ports • System-Wide Efficiency Improvements	3.7 (3%)((2%))
Million Solar Roofs	2.1 (2%)((1%))
Medium/Heavy Duty Trucks • Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction (Aerodynamic Efficiency) • Medium- and Heavy-Duty Vehicle Hybridization	1.4 (<1%)((<1%))
High Speed Rail	1.0 (<1%)((<1%))
Industrial Measures (for sources covered under cap&trade program) • Refinery Measures • Energy Efficiency and Co-Benefits Audits	0.3 (<.5%)((<.5%))
Additional Reductions Necessary to Achieve the Cap	34.4 (23%)((20%))
ESTIMATED REDUCTIONS RESULTING FROM UNCAPPED SECTORS	**27.3**
Industrial Measures (for sources not covered under cap&trade program) • Oil and Gas Extraction and Transmission	1.1 ((<1%))
High Global Warming Potential Gas Measures	20.2 ((12%))
Sustainable Forests	5.0 ((3%))
Recycling and Waste (landfill methane capture)	1.0 ((.6%))
TOTAL REDUCTIONS COUNTED TOWARDS 2020 TARGET	**174**[3]

Source: Table 2 of the Climate Change Scoping Plan: A Framework for Change. Prepared by the California Air Resources Board, pursuant to AB 32 the California Global Warming Solution Act of 2006. December 2008.

[1] This number represents an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. CARB will establish regional targets for each Metropolitan Planning Organization following input of the Regional Targets Advisory Committee and a public stakeholders consultation process per SB 375.

[2] (Percentages) are relative to the capped sector subtotal of 146.7 $MMTCO_2E$, and ((percentages)) are relative to the total target reduction of 174 $MMTCO_2E$, and may not total 100 due to rounding.

[3] The total reduction for the recommended measures slightly exceeds the 169 $MMTCO_2E$ of reductions estimated in the BAU 2020 Emissions Forecast. This is the net effect of adding several measures and adjusting the emissions reduction estimates for some other measures.

~~**TABLE 2**~~
~~**GHG EMISSION FACTORS**~~

~~Gas~~	~~Vehicle Emission Factors (pounds/gallon)[1]~~	~~Electricity Generation Emission Factors (pounds/MWh)[2]~~	~~Natural Gas Combustion Emission Factors (pound/million ft^3)[3]~~
~~Carbon Dioxide~~	~~19.564~~	~~1,340~~	~~120,000~~
~~Methane~~	~~0.00055~~	~~0.0111~~	~~2.3~~
~~Nitrous Oxide~~	~~0.0002~~	~~0.0192~~	~~2.2~~

~~[1]SOURCE: BAAQMD 2006.~~
~~[2]SOURCE: U.S. DOE 2002.~~
~~[3]SOURCE: U.S. EPA 1998.~~

Below is a summary of the BAU GHG emissions due to construction and operation. ~~of the Proposed Project. Emissions were calculated for "business as usual" conditions. "Business as usual" is considered to be development according to the current energy efficiency standards established in Title 24.~~ The Proposed Project would incorporate ~~measures into the~~ project design features that would reduce emissions compared to BAU~~from "business as usual"~~ conditions. This comparative evaluation is ~~ese measures are also~~ discussed below in Section 5.0.

4.1 BAU Construction GHG Emissions

Construction GHG emissions w~~c~~ould result from heavy construction equipment, worker VMT, and water usage. Emissions of CO_2 during construction of the Proposed Project under BAU conditions were calculated using the URBEMIS 2007 computer program (Rimpo and Associates 2008). It was thus estimated that t~~T~~he Proposed Project under BAU would emit 9,169 pounds per day of CO_2 during each year from 2012 through 2016 during grading of the Project Site, and approximately 25,890 pounds per day of CO_2 during each year from 2017 through 2024. This is equivalent to 1,518 metric tons of CO_2per year from 2012 through 2016 and 4,286 metric tons of CO_2 per year from 2017 through 2024. URBEMIS 2007 output**s** are contained in Attachment 1.

As identified below in Section 5.1, the Proposed Project does not include any specific features or practices that would measurably reduce this volume of GHG emissions associated with project construction.

4.2 BAU Operational GHG Emissions

Operational sources of GHG emissions include energy, transportation, and solid waste.

4.2.1 Energy

Energy emissions are due to electricity, natural gas, and water use. Each is discussed below.

4.2.1.1 Electricity

Due to the nature of the electrical grid, it is not possible to say with certainty exactly where this power will be generated. Therefore, GHG emissions resulting from electricity generation associated with ~~the Proposed Project~~BAU were estimated using national

average emission factors developed by the U.S. Department of Energy (U.S DOE 2002) and existing electricity consumption rates. In 2006, the average electricity consumption for a residential consumer was 7,080 kilowatt hours (kWh) per unit per year, and the average electricity consumption for a commercial consumer was 69,216 kWh per year (U.S. DOE 2006). For the purposes of this analysis, it was assumed that the electricity consumption for the proposed school would be the same as for a commercial consumer. The proposed residential units and elementary school would consume 6,044,736 kWh (6,044.736 megawatt hours [MWh]) per year. This would result in 3,691.03 metric tons of CO_2 Eq per year. Electricity emission calculations are contained in Attachment 2.

It should also be noted that there are legislative and regulatory efforts underway to reduce GHG emissions from statewide electricity generation. Implementation of the Rrenewable Pportfolio Sstandard, which requires utilities to purchase 20 percent of their electricity from renewable sources by 2010 and 33 percent by 2020, would reduce statewide GHG emissions by another 123 percent overall according to the CARB Scoping Plan. This reduction is not accounted forconsidered in the BAU or Proposed Project "business as usual"energy calculations. However, as identified below in Section 5.1, the Proposed Project does include specific design features that would improve energy efficiency compared to BAU by 45 percent and thus substantially reduce BAU GHG emissions associated with electricity consumption.

4.2.1.2 Natural Gas

BAU GHG emissions resulting from natural gas combustion were estimated using the emission factors developed by the U.S. EPA (1998) and existing natural gas consumption rates. In 2006, the average natural gas consumption rate for a residential consumer was 67,847 cubic feet per year, and the natural gas consumption rate for a commercial consumer was 537,416 cubic feet per year (U.S. DOE 2007). The Proposed Project under BAU would thus consume 57,800,284 cubic feet per year. This would result in 3,165.28 metric tons of CO_2 Eq per year. Natural gas emission calculations are contained in Attachment 2.

As identified below in Section 5.1, the Proposed Project includes design features that would improve energy efficiency compared to BAU by 45 percent and thereby subsequently reduce BAU GHG emissions associated with natural gas combustion.

4.2.1.3 Water

Water use and energy are often closely linked. The provision of potable water to residents consumes large amounts of energy associated with five stages: source and conveyance, treatment, distribution, end use, and wastewater treatment. This inventory estimated that delivered water for the Proposed Project would have an embodied energy of 2,779 kWh/acre foot or 0.0085 kWh/gallon (Torcellini et al. 2003). Under BAU, tThe Proposed Project would require 728,000 gallons per day. The embodied energy demand associated with this BAU water use was converted to GHG emissions with the same electrical grid coefficients as the other purchased electricity. This would result in 1,250.33 metric tons of CO_2 Eq per year being generated by water use associated with BAU. Water emission calculations are contained in Attachment 2.

As identified below in Section 5.0, the Proposed Project includes design features that would improve water conservation by at least 25 percent compared to BAU (i.e., the

existing plumbing code) and would subsequently reduce BAU GHG emissions associated with the energy use embodied in supplying water.

4.2.2 Transportation

BAU vVehicle emissions were estimated using the emission factors developed by the Bay Area Air Quality Management District and the total VMT per day estimated by the URBEMIS 2007 computer program for the Proposed Project. The estimated VMT was based on tThe Proposed Project'swould generation ofe 8,740 average daily trips (ADT) as determined in the Project traffic report (LOS Engineering 2009). Vehicle fuel mileage was obtained from the EPA. The EPA estimates that the average fuel economy for passenger cars is 23.9 miles per gallon (mpg) and the average fuel economy for light trucks is 17.4 mpg (U.S. EPA 2005). The Proposed Project is residential, and the vehicle population would likely consist of passenger cars and light trucks. To be conservative, a fuel economy of 17.4 mpg was multiplied by the estimated daily VMT of 87,374used to calculate vehicle emissions. It should also be noted that fuel economy is likely to improve in future years. Vehicle emissions associated with BAU conditionsthe Proposed Project would generate thus be 16,393.23 metric tons of CO_2 Eq per year. Vehicle emission calculations are contained in Attachment 2.

It should also be noted that fuel economy is likely to improve in future years, in accordance with the federal CAFE Standards, thus potentially reducing GHG emissions associated with VMT. In future years statewide vehicular GHG emissions would be further reduced through mandatory regulations on vehicle manufacture and vehicle fuels. These are the AB 1493 Pavley Vehicle GHG Standards and the Low Carbon Fuel Standards, identified in the CARB Scoping Plan to reduce overall statewide GHG emissions by 18 percent and 9 percent respectively. A third CARB measure, the Vehicle Efficiency Measure, is estimated to reduce statewide GHG emissions by another 2.5 percent.

The GHG reductions from these federal and state measures are not accounted for in the BAU GHG calculations. This is in accordance with CARB's projection of statewide BAU 2020 vehicle emissions and with the Scoping Plan's needed GHG reductions estimates. However, as identified below in Section 5.2, the AB 1493 Pavley and LCFS reductions in vehicle GHG emissions are accounted for in the vehicle emissions estimate of the Proposed Project. This is in keeping with the CARB Scoping Plan's GHG reduction measures identified as necessary to achieve 1990 GHG emissions levels by 2020.

4.2.3 Solid Waste

The disposal of solid waste produces GHG emissions from anaerobic decomposition in landfills, incineration, transportation of waste, and disposal. It was assumed that multi-family residential developments would generate 1.2 tons per year per unit, based on development in compliance with current waste management regulations. The Proposed Project under BAU assumptions would therefore generate 567.6 tons of solid waste per year. The EPA's WARM was used to calculate the GHG emissions associated with this volume ofdue to solid waste generated by the Proposed Project. WARM divides solid waste into many different categories including yard trimmings, paper products, metals, aluminum, glass, food waste, plastics, and other materials. An estimate of the distribution of these materials was obtained from the U.S. EPA (2008). WARM input and

output are contained in Attachment 3. The solid waste associated with ~~the Proposed Project~~ BAU was thus calculated to~~would~~ generate 342 metric tons of CO_2 Eq per year.

As identified below in Section 5.1, the Proposed Project was also calculated to generate this amount of solid waste-associated GHG emissions because potential waste reductions attributed to project design features were not readily quantifiable.

4.2.4 Total BAU GHG Emissions

Table ~~4~~3 shows the projected combined operational GHG emissions, expressed as equivalent CO_2 (CO_2 Eq) emissions~~,~~ that would result~~ing~~ from the Proposed Project under BAU~~"business as usual"~~ conditions.

TABLE ~~4~~3
~~"~~BUSINESS AS USUAL~~"~~ GHG EMISSIONS
(metric tons/year)

Emission Source	CO_2	N_2O	CH_4	Total CO_2 Eq[1]
Electricity Usage Emissions	3,674.07	0.05	0.03	3,691.03
Natural Gas Usage Emissions	3,146.13	0.06	0.06	3,165.28
Water Usage Emissions	1,244.59	0.02	0.01	1,250.33
Vehicular Emissions	16,331.83	0.17	0.46	16,393.23
Solid Waste Emissions	Na	Na	Na	342.00
Total CO_2 Eq[1]				24,841.87

[1] Equivalent - Totals may vary from the sum of the sources due to independent rounding.

As shown, the Proposed Project under BAU assumptions is projected to emit 24,841.87 metric tons of CO_2 Eq per year ~~under "business as usual" conditions~~.

5.0 PROPOSED PROJECT GREENHOUSE GAS INVENTORY AND REDUCTIONS ASSOCIATED WITH ~~SUMMARY OF RECOMMENDED~~ PROJECT DESIGN FEATURES~~, IMPACTS, AND MITIGATION MEASURES~~

~~There is no set threshold for GHG emissions; however, given the State's mandated goal of reducing statewide GHG emissions to 1990 levels, the report, *The California Environmental Quality Act; Addressing Global Warming Impacts at the Local Agency Level* (State of California 2008) provides a list of measures appropriate for the Proposed Project that minimizes the significant effect of global climate change. The Proposed Project, as planned, incorporates many of these measures. With the implementation of these measures, global climate change impacts from the Proposed Project would be less than significant.~~ The significance threshold identified in Section 3.1 states that the Proposed Project would generate significant climate change impacts if it would interfere with the State's ability to achieve the 2020 GHG reduction goals and strategies identified in AB 32 and EO S-3-05. The significance threshold further states that in order to achieve the AB 32/EO S-3-05 goals for 2020, the San Diego region must reduce its GHG emissions by 33 percent compared to BAU (as defined in the CARB BAU 2020 Forecast). Therefore, this section provides an evaluation of the significance of the Proposed Project's contribution of GHG emissions to cumulative statewide GHG emissions by quantifying the Proposed Project's 2020 GHG emissions relative to BAU.

The quantification of the Proposed Project's GHG emissions accounts for reductions in GHGs associated with efficient energy and water use, as well as reductions in vehicle

emissions due to statewide measures. The Proposed Project's GHG reducing design features are described in the following Section 5.1. The State measures to reduce vehicle emissions also counted in the Proposed Project's GHG estimates are described in Section 5.2. The Proposed Project's GHG emissions estimates, accounting for both sets of these GHG reductions, are included in Section 5.3.

5.1 Project Design Features That Reduce GHG Emissions

~~As discussed above, the CEC recommends a Tier II goal for residential and commercial projects of a 30 percent reduction in building combined space heating, cooling, and water heating energy compared to Title 24 standards. As a project design measure, the Proposed Project would increase energy efficiency 30 percent beyond that required by Title 24. Therefore, GHG emissions due to energy use would be less than significant.~~ As described in Section 1.2, the Proposed Project would conform to the standards and requirements of the BIA's California Green Builder Program. Thus, t~~T~~he following features~~measures~~ have been incorporated into the project design to ~~increase further~~ increase energy and water efficiency and decrease ~~"business as usual"~~BAU GHG emissions~~ due to transportation, water use, waste, and construction~~.

Energy Efficiency – to achieve 30 percent better than current 2008 Title 24 Standards.

A 30 percent reduction in combined space heating, cooling, and water heating energy use, compared to the current 2008 Title 24 Energy Efficiency Standards, would be achieved through

- ~~Build homes that comply with the~~installation of U.S. EPA's Energy Star-rated appliances in all residential units~~ criteria, which results in homes that are at least 30% more energy efficient than required by Title 24.~~;
- minimization of site lighting to only that necessary for security, safety, and identification;
- provision of o~~O~~utdoor ~~and indoor~~ shaded areas ~~have been implemented into the design of the multi-family planning areas~~ to improve natural cooling on-site and reduce energy needs for artificial cooling~~use. Large parking lots have been avoided and plantings throughout the site will provide comfortable living spaces, while reducing energy consumption~~.;
- avoidance of large parking surfaces to minimize heat island effect;
- building orientation to capture natural daylighting and cooling opportunities where feasible;
- incorporation of cool roof technologies and light colored paving where feasible;
- design and construction of the future elementary school to achieve a minimum Silver certification under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system;

- participation in the CGB Program, that includes submittal of a completed CGB application to the CGB Program coordinator and final inspections by CGB certified inspectors to ensure it has met the CGB requirements; and

- submittal of a Title 24 Compliance Report that demonstrates the targeted energy reductions through a CEC-approved energy performance model.

~~•The compact nature of the Proposed Project and the provision of extensive trails and sidewalks will encourage residents to walk and bike within the community, thus minimizing energy usage.~~

~~□The Proposed Project will minimize site lighting to that necessary for security, safety, and identification.~~

Based on these features, the Proposed Project's GHG emissions estimates in Section 5.3 associated with electricity and natural gas use account for a 45 percent reduction in energy use compared to BAU. This is because the CARB BAU 2020 emissions forecast associated with residential and non-residential building energy use assumed compliance with the then-current 2005 Title 24 energy code. In other words, the BAU 2020 GHG estimates were based on 2005 Title 24-compliant buildings. The current 2008 Title 24 energy code includes standards that achieve 15 percent greater energy efficiency than the former 2005 Title 24 energy code. Therefore, given that the Proposed Project would achieve 30 percent greater energy efficiency than 2008 Title 24, it would achieve 45 percent greater energy efficiency than the 2005 Title 24 energy code. The CARB Scoping Plan, which was developed to identify measures to achieve targeted reductions in BAU GHG emissions, anticipated that improvements in the Title 24 energy code would occur over time and would yield an approximate 15 percent reduction in overall statewide GHG emissions by 2020 (see Table 2, Energy Efficiency measure).

Water Conservation - to achieve 25 percent better than current 2007 plumbing code.~~and Efficiency~~

Compared to~~Of~~ the 728,000 gpd required by the Proposed P~~p~~roject assuming BAU water consumption rates, the Proposed Project's implementation of water conservation and efficiency design features ~~measures will~~would reduce the overall project water demand by approximately 25 percent. A minimum 25 percent reduction in water use, compared to the current 2007 plumbing code (Part 5 of the Title 24 California Building Standards Code), would be achieved through various indoor-water and outdoor-water conservation practices, such as

~~•The Proposed Project will use reclaimed water to irrigate HOA-maintained common areas and retained agricultural groves in dry months.~~

~~□By utilizing the new stormwater regulations, more efficient irrigation will be used. This will prohibit a large amount of water running off into the adjacent wetland~~

- installation of~~Homeowners will utilize~~ low water usage appliances in all residential units and non-residential buildings~~.~~;

- participation in the CGB Program, that includes submittal of a completed CGB application to the CGB Program coordinator that demonstrates the 25 percent reduction in water use by verifying each plumbing fixture and fitting meets the reduced flow rate or by calculating a 25 percent reduction in the building water use baseline, and final inspections by CGB certified inspectors to ensure it has met the CGB requirements;

- use of irrigation controllers such as irrigation timers and multi-programmable irrigation clocks in all landscaped areas;

- use of a high-efficiency drip irrigation system and reclaimed water to irrigate HOA-maintained common areas and retained agricultural groves in dry months; and;

- at the time of final inspection, a manual shall be placed in each building that includes information about water conservation.

Thus, in addition to water conservation design that would reduce indoor potable water demand, t~~T~~he Proposed Project demand for~~amount of~~ delivered water would~~will~~ be ~~further~~ decreased by utilizing reclaimed water~~recycled wastewater~~ to irrigate the HOA recreational areas, parks, the elementary school fields, common area slopes and existing avocado groves retained on-site. Presently, the existing avocado and citrus groves are irrigated with groundwater on the property. This same groundwater would~~will~~ continue to be utilized on the retained avocado groves during drier months to supplement recycled water supplies, further reducing the delivered water requirement. Finally, the project may offset the remainder of its delivered water requirement by participating in an offset program with the San Diego County Water Authority (SDCWA) or a Municipal Water District (MWD). The goal of these actions is to achieve a net zero project-wide water demand. However, given the embodied energy associated with the conveyance and treatment of water, whether or not it is reclaimed or part of an offset program, the GHG emissions estimates of the Proposed Project in Section 5.3 only account for a 25 percent reduction in the Proposed Project's water demand compared to BAU.

Solid Waste Reduction Measures

In accordance with CGB criteria and state and local laws, at least 50 percent of on-site construction waste and ongoing operational waste would be diverted from landfills through reuse and recycling as follows:

- The Proposed Project will recycle construction materials as much as possible.
- Recycling bins as well as ~~trash~~ yard waste bins will be provided to each resident.
- The Proposed Project will conform to the applicable County recycling activities.

The GHG reducing effects of these efforts cannot be accurately quantified and are not included in the Proposed Project GHG estimates.

Landscape ~~Use~~ Measures

To minimize the use of impervious areas and loss of sequestration due to vegetation removal:

- The existing groves and trees along the primary and secondary roadways will be preserved whenever possible, and the ~~design incorporates a full~~ landscape plan ~~to~~ will provide streetscape landscaping and landscaping throughout the Proposed Project. 49.3 acres of existing groves will also be retained.

- The design has incorporated the existing hiking and horse trails, the existing access driveways, the connection of roads through neighboring properties and to the two adjoining active projects, and keeps much of the existing agriculture.

- To maximize shade and reduce heat island effects, the landscape plan includes strategic location of deciduous trees and other vegetation and shading structures.

- Impervious surfaces, including paved parking areas, would also be minimized and pervious pavers used instead where practical.

The GHG reducing effects of these efforts cannot be accurately quantified and are not included in the Proposed Project GHG estimates.

Multi-Modal Transportation ~~and Motor Vehicles~~Opportunities

The Proposed Project's design provides multi-modal opportunities that would potentially reduce future residents' dependence on the automobile.

- Bike lanes and trails and pathways are designed throughout the subdivision to promote non-motorized transportation.

- The design of ~~Meadowood~~ the Proposed Project encourages residents to walk and bike through their neighborhoods to the school, park and town center and commercial areas located in adjacent projects.

- ~~Accessible walkways and trails are provided from the residences to transit service. Several wide accommodating walkways and trails are provided throughout the Proposed Project to provide accessibility to the residents of Meadowood.~~

- Circulation within the Proposed Project is accomplished using a system of efficient roadways combined with a trail and sidewalk system for bike and pedestrian use. Interior roads link through the Proposed Project, Campus Park and the Campus Park West properties allowing residents easy access to the planned town center and commercial areas located in these other projects.

- Bicycle riding is encouraged with designated bike lanes along the roadways and a separate 10-foot wide multi use, non-motorized trail along Horse Ranch Creek Road to encourage biking to the town center or to the college campus.

The GHG reducing effects of these efforts cannot be accurately quantified and are not included in the Proposed Project's GHG estimates below in Table 5.

5.2 State Measures That Reduce Vehicle GHG Emissions

As indicated above in Section 4.2.2, in future years statewide vehicular GHG emissions would be reduced through mandatory federal and state regulations on vehicle manufacture and vehicle fuels. These include the federal CAFE Standards which would increase average vehicle fuel economy to 35 mpg by 2020; the state Pavley GHG Vehicle Emissions Standards which set increasingly stringent emissions limits on vehicles, requiring improvement in vehicle engine technologies; and the state LCFS which reduces the carbon content of vehicle fuels. All of these actions have been approved by either the national or state legislatures and are coming into effect on a staggered timeline, with 2016 being the earliest vehicle model year affected.

It can be assumed that newer vehicles associated with the Proposed Project would benefit from these regulations, and estimated vehicle emissions would accordingly decrease. By accounting for the Scoping Plan measures already adopted, the estimated vehicle emissions associated with the Proposed Project could decrease by nearly 30 percent, resulting in GHG emissions of 16,393.23 metric tons CO_2 Eq (compared to the 11,475.26 metric tons CO_2 Eq estimated for BAU) as shown in Table 5. These emissions reductions would be achieved through mandatory statutes applicable to all vehicle emissions within the state and are not attributable to specific GHG reduction features of the Proposed Project.

5.3 Proposed Project GHG Emissions

The estimated Proposed Project GHG emissions with incorporation of GHG-project design features and State measures to reduce vehicle emissions are summarized below in Table 5. These are shown in comparison to the BAU GHG emissions.

TABLE 5
PROOSED PROJECT GHG EMISSIONS
(metric tons/year)

Emission Source	BAU Total CO_2 Eq	Proposed Project Total CO_2 Eq	Percent Reduction
Electricity Usage Emissions	3,691.03	2,030.07	45%**
Natural Gas Usage Emissions	3,165.28	1,740.90	45%**
Water Usage Emissions	1,250.33	937.75	25%**
Solid Waste Emissions	342.00	342.00	0%
Vehicular Emissions	16,393.23	11,475.26	30%*
Total CO_2 Eq[1]	**24,841.87**	**16,525.98**	**34**%

* Denotes GHG reductions achieved through State measures.
** Denotes GHG reductions achieved through project-specific design features.

By implementing increased energy- and water-efficiency performance into the Proposed Project design, resulting GHG emissions would be 34 percent less than BAU GHG emissions for 2020. The Proposed Project's contribution to cumulative statewide GHG emissions would therefore be less than significant.

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