CHAPTER 2.0

SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSED PROJECT IS IMPLEMENTED

SECTION 2.1

AIR QUALITY

CHAPTER 2.0 – SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSED PROJECT IS IMPLEMENTED

2.1 Air Quality

The evaluation of air quality impacts incorporates the results of the Air Quality Technical Report prepared by Scientific Resources Associated (SRA) in February 2008 (Appendix D to this EIR). The evaluation of climate change incorporates the results of the emissions inventory prepared by CTG Energetics, Inc. (Appendix Y to the Merriam Mountains Specific Plan Draft EIR, dated August 2007). Applicable information from both these documents is summarized below.

2.1.1 Discussion of Existing Conditions Related to Air Quality

2.1.1.1 Discussion of Existing Conditions Related to Air Quality – Criteria Pollutants

Climate and Meteorology

The project site is located in the San Diego Air Basin (SDAB). The climate of the SDAB is dominated by a semi-permanent high pressure cell located over the Pacific Ocean. This cell influences the direction of prevailing winds (westerly to northwesterly), maintains clear skies for much of the year, and also creates two types of temperature inversions that may act to degrade local air quality.

Subsidence inversions occur during the warmer months, as descending air associated with the Pacific high pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The second inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation, and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions produce ozone, commonly known as smog.

Regulatory Setting

Under the authority of the federal Clean Air Act (CAA) and its amendments, the United States Environmental Protection Agency (USEPA) regulates air quality of specific pollutants as defined by ambient air concentrations through the National Ambient Air Quality Standards (NAAQS). USEPA established the NAAQS for certain concentrations of six "criteria" pollutants in the ambient air: nitrogen dioxides, sulfur oxides, lead (Pb), ozone (O_3), carbon monoxide (CO), and particulate matter. The USEPA has established both primary and secondary standards for several criteria pollutants, which include ozone, nitrogen dioxide (NO_2), carbon monoxide, sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), and lead (Pb).

Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants.

The CAA allows states to adopt ambient air quality standards (AAQS) and other regulations provided they are at least as stringent as federal standards. The California Air Resources Board (CARB) has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988 and has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant. Table 2.1-1a presents a summary of the AAQS adopted by the federal and California Clean Air Acts. Table 2.1-1b provides a summary of health effects from the major criteria air pollutants.

The CARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The CARB reviews operations and programs of the local air districts and requires each air district with jurisdiction over a nonattainment area to develop a strategy for achieving the NAAQS and CAAQS. The local air districts have the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations.

In the SDAB, the San Diego Association of Governments (SANDAG) and the San Diego Air Pollution District (APCD) are responsible for developing and implementing the clean air plan for attainment and maintenance of the CAAQS. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991 and is updated every three years, most recently in 2004. The RAQS outlines APCD's plans and control measures designed to attain the state air quality standards for O_3. The APCD has also developed the SDAB's input to the State Implementation Plan (SIP), which is required under the CAA for areas that are out of attainment with air quality standards. As of July 28, 2003, the SDAB was reclassified as an attainment area for the 1-hour NAAQS for O_3. On April 15, 2004, the SDAB was designated a basic nonattainment area for the 8-hour NAAQS for O_3. The SDAB is in attainment for all other criteria pollutants under the NAAQS. The SDAB is currently classified as a nonattainment area under the CAAQS for O_3 and PM_{10}.

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County, to project future emissions and then determine the strategies necessary for the reduction of emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and the County. As such, projects that propose development that is consistent with the growth anticipated by the general plans and SANDAG's growth forecasts would be consistent with the

RAQS and the SIP. In the event that a project would propose development which is less dense than anticipated within the general plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the general plan, the project might be in conflict with the RAQS and SIP and might have a potentially significant impact on air quality. However, if the project and other development in SANDAG's North County East Major Statistical Area (MSA) result in growth greater than SANDAG's growth projections, it is in conflict with RAQS and SIP and would result in a significant air quality impact. The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the SDAB.

Existing Air Quality/Attainment Status

The CARB designates those portions of the state where federal or state AAQS are not met as "non-attainment" areas. Table 2.1-1c summarizes the air quality attainment status for the SDAB. As discussed above, where a pollutant exceeds standards, the federal and state Clean Air Acts require air quality management plans that demonstrate how the standards will be achieved. These laws also provide the basis for the implementing agencies to develop mobile and stationary source performance standards.

Historically, violations of federal and state AAQS for ozone, particulate matter, and CO have occurred throughout San Diego County. Since the early 1970s, substantial progress has been made toward controlling these pollutants. Although some air quality improvements have occurred, violations of AAQS for particulate matter and ozone are persistent.

Toxic Air Contaminants

Toxic air contaminants (TACs) refer to a category of air pollutants that pose a present or potential hazard to human health, but which tend to have more localized impacts than criteria pollutants. The CARB recently identified diesel particulate matter as the predominant TAC in California. Diesel particulate matter is emitted into the air via diesel-powered mobile vehicles. Such vehicles include heavy-duty diesel trucks, construction equipment, and passenger cars. Certain Reactive Organic Gases (ROGs) may also qualify as TACs. Because no safe level of emissions can be established for TACs regionwide, the regulation of toxic air pollutants is based on the levels of cancer risk.

The CARB publishes detailed toxic sampling results from all California manufacturing sites. Excluding diesel particulates, a 70% reduction in TACs has been measured in El Cajon (the closest monitoring station to the project site) since 1989. The estimated ambient incremental cancer risk from TACs was 158 in one million for El Cajon in 2004, down from 545 in one million in 1989.

2.1.1.2 Discussion of Existing Conditions Related to Air Quality – Climate Change

Recognizing public interest regarding climate change and recent California legislation on this topic, this section provides information and analysis on climate change related to the proposed project. The information provided is based on recently established State of California goals for reducing greenhouse gas (GHG) emissions, as well as a project-specific emissions inventory developed for the Merriam Mountains project. The Merriam Mountains inventory quantifies emissions based on a business-as-usual scenario, as well as with proposed project design features, consistent with State of California goals.

Regulatory Framework

International and Federal Legislation

In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess "the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation" (Association of Environmental Professionals [AEP] 2007).

On March 21, 1994, the United States joined other countries in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the UNFCCC, 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 (AEP 2007 June).

The Kyoto Protocol is a treaty made under the UNFCCC. Countries can sign the treaty to demonstrate their commitment to reduce their emissions of GHGs or engage in emissions trading. More than 160 countries and 55% of global emissions are under the protocol. United States Vice President Al Gore symbolically signed the Protocol in 1998. However, in order for the Protocol to be formally ratified, it must be adopted by the U.S. Senate, which was not done during the Clinton administration. The current President, George W. Bush, has indicated that he does not intend to submit the treaty for ratification. As of October 2008, 182 countries and the European Economic Community have ratified the agreement.

In October 1993, President Clinton announced his Climate Change Action Plan, which had a goal of returning GHG emissions to 1990 levels by the year 2000. This was to be accomplished through 50 initiatives that relied on innovative voluntary partnerships between the private sector and government aimed at producing cost-effective reductions in GHG emissions. Data on progress on the 50 initiatives are not readily available.

In June 2008, the EPA released an Advance Notice of Proposed Rulemaking (ANPR) inviting comments on options for possible regulation of GHG emissions under the Clean Air Act. Key issues for discussion and comment in the ANPR included:

- Descriptions of key provisions and programs in the CAA, and advantages and disadvantages of regulating GHGs under those provisions;
- How a decision to regulate GHG emissions under one section of the CAA could or would lead to regulation of GHG emissions under other sections of the Act, including sections establishing permitting requirements for major stationary sources of air pollutants;
- Issues relevant for Congress to consider for possible future climate legislation and the potential for overlap between future legislation and regulation under the existing CAA; and,
- Scientific information relevant to, and the issues raised by, an endangerment analysis (i.e., whether emissions of an air pollutant from new motor vehicles would be reasonably anticipated to contribute to air pollution that endangers public health or welfare).

The comment period ended on November 28, 2008, but no further action by EPA has occurred as of this writing.

California Legislation

Although not originally intended to reduce GHG emissions, California's Energy Efficiency Standards for Residential and Nonresidential Buildings (24 CCR 6) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest amendments were made in October 2005. The premise for the standards is that energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in GHG emissions. Therefore, increased energy efficiency in buildings results in fewer GHG emissions on a building-by-building basis.

California Assembly Bill No. 1493 (AB 1493), enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Regulations adopted by CARB will apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce GHG emissions from the light-duty/passenger vehicle fleet by an estimated 18% in 2020 and by 27% in 2030, compared to today (AEP 2007).

Senate Bill No. 97 (SB 97) recognizes that climate change in relation to environmental issues and requires analysis under CEQA. SB 97, approved in August 2007, provides direction to the Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources

Agency guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions by July 1, 2009 The Resources Agency is required to certify or adopt those guidelines by January 1, 2010. This bill also protects projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 from claims of inadequate analysis of GHG as a legitimate cause of action. This latter provision will be repealed on January 1, 2010. Thus, this "protection" is highly limited to a handful of projects and for a short time period (California Air Pollution Control Officers Association, CAPCOA 2008, January).

On June 19, 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities, should be identified and estimated. The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures that are necessary to reduce GHG emissions to a less than significant level. The advisory did not recommend a specific threshold of significance—either quantitative or qualitative—leaving this to the lead agency's judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable.

SB 1078 established the Renewal Portfolio Standard program which requires an annual increase in renewable generation by the utilities equivalent to at least one percent of sales, with an aggregate goal of 20% by 2017. The California Public Utilities Commission (CPUC) accelerated the goal, requiring utilities to obtain 20% of their power from renewable sources by 2010 (SB 107). Currently, CPUC is considering ways to achieve 33% renewable energy by 2020 and is working collaboratively with the California Energy Commission to implement the Renewable Portfolio Standard program.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, GHG emission reduction targets as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80% below 1990 levels. Some literature equates these reductions to 11% by 2010 and 25% by 2020.

The Secretary of CalEPA leads a Climate Action Team made up of representatives from the agencies listed above to implement global warming emission reduction programs identified in the Climate Action Plan and report on the progress made toward the goals established in Executive Order S-03-05. The Climate Action Plan report to the Governor contains recommendations and strategies to help ensure the targets in Executive Order S-03-05 are met.

In 2006 the California State Legislature adopted Assembly Bill No. 32 (AB 32), the California Global Warming Solutions Act of 2006. AB 32 requires the CARB, the state agency charged

with regulating statewide air quality, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. AB 32 establishes a multi-year timeline for the development and implementation of GHG reporting and mitigation policy. The first step is the development of "early action" measures by June 30, 2007. A draft version of these early action measures was circulated for public comment beginning on April 20, 2007. The measures represent discrete opportunities to achieve GHG reductions that are proposed to be implemented by January 1, 2010. As the policy-making process continues, CARB will consider a broader set of mitigation measures, including carbon sequestration projects and best management practices that are technologically feasible and cost-effective. GHGs as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

On December 11, 2008, CARB approved the Scoping Plan to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and CAT early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The analyses of many potential GHG emission reduction strategies that are not recommended as early actions are currently underway and will continue as part of the Scoping Plan development. Additional development of these measures and adoption of the appropriate regulations will occur over the next two years, becoming effective by January 1, 2012. The key elements of the Scoping Plan include (CARB 2008):

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33%;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.

Executive Order S-01-07 was issued by the Governor of California on January 18, 2007. Essentially, the order mandates the following: that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020; and that a Low Carbon Fuel Standard for transportation fuels be established for California. CalEPA is identified as the lead in coordinating implementation of Executive Order S-01-07, while CARB is identified in AB-32 as establishing statewide GHG emissions standards. Coordination between CARB and CalEPA will be needed to implement the requirements of AB-32 and Executive Order S-01-07.

In August 2008, the legislature passed and on September 30, 2008, Governor Schwarzenegger signed SB 375 (Steinberg), which addresses GHG emissions associated with the transportation section through regional transportation and sustainability plans. Under SB 375 CARB must appoint a Regional Targets Advisory Committee to recommend factors to be considered and methodologies to be used for setting greenhouse gas emission reduction targets for the affected regions. The RTAC will include representatives from the League of California Cities, California State Association of Counties, metropolitan planning organizations, developers, planning organizations, and other stakeholder groups. By September 30, 2010, CARB will assign to regional GHG reduction targets for the automobile and light truck sector for 2020 and 2035. The targets are required to consider the emission reductions associated with vehicle emission standards (see SB 1493), the composition of fuels (see Executive Order S-1-07), and other CARB-approved measures to reduce GHG emissions. Regional metropolitan planning organizations (MPOs) will be responsible for preparing a Sustainable Communities Strategy (SCS) within the Regional Transportation Plan. The goal of the SCS is to establish a development plan for the region, which, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If an SCS is unable to achieve the GHG reduction target, an MPO must prepare an Alternative Planning Strategy (APS) demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies. SB 375 provides incentives for streamlining CEQA requirements by substantially reducing the requirements for "transit priority projects," as specified in SB 375, and eliminating the analysis of the impacts of certain residential projects on global warming and the growth-inducing impacts of those projects when the projects are consistent with the SCS or APS.

In summary, current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB-32 and Executive Order S-01-07. AB-32 establishes a goal of reaching 1990 levels by 2020 and describes a process for achieving that goal. Executive Order S-01-07 generally calls for the following for reduction of GHG emissions:

- 2000 levels by 2010 (11% below business-as-usual)
- 1990 levels by 2020 (25% below business-as-usual)

- 80% below 1990 levels by 2050.

Business-as-usual may be defined as emissions levels that would occur if California continued to grow and add new GHG emissions but did not adopt any measures to reduce emissions. As specifically related to a development project such as Merriam Mountains, application of Title 24 energy efficiency requirements and existing federal, state, and local regulations are considered business-as-usual (BAU). A project that reduced GHG emissions below BAU and incorporated the measures that reduce GHG emissions is considered consistent with State of California goals for reducing GHG emissions under AB32 and Executive Order S-01-07.

A project such as Merriam Mountains, anticipated to complete construction in the 2010–2020 time frame, could be considered consistent with State of California goals for the year 2020 if it achieved emissions reductions from 11% to 25% below BAU. This issue is further discussed in Section 2.1.3.2 of the EIR.

Relationship to CEQA

Specific legislative or regulatory guidance does not yet exist. However CEQA's regular rules provide guidance regarding topics such as climate change. Sections 15144 and 15145 of the CEQA Guidelines address forecasting and speculation. Section 15144 notes that drafting an EIR necessarily involves some degree of forecasting. An agency must use its best efforts to find out and disclose all that it reasonably can. Section 15145 deals with the difficulty in forecasting where a thorough investigation is unable to resolve an issue and the answer remains purely speculative. The Lead Agency is not required to engage in idle speculation.

Section 15146 of the CEQA Guidelines speaks to informed decision-making. The Office of Planning and Research commentary for this section notes that the rule of reason applies, and the analysis must be specific enough to permit informed decision-making and public participation. However, an EIR does not need to engage in a speculative analysis of environmental consequences.

With regard to the topic of climate change, it is possible to document the current state of research regarding this topic and to forecast an emissions inventory for GHGs associated with the Merriam project at build-out. Data are provided in this section to allow for informed decision-making and public participation regarding this topic.

In the context of CEQA, climate change issues associated with the proposed project may be addressed in two ways:

1) How does the project affect climate change? At this time there is not enough evidence or data available to reasonably conclude the extent to which any individual project will affect or change global climate. However, through the use of forecasting, preparing an

emissions inventory for the project based on the project description, and incorporating features in the project design to reduce GHG emissions, a comparative analysis can be conducted which shows the difference in GHG emissions that would be emitted under a business-as-usual scenario for the project, with a future-state scenario for the project, if GHG Reduction Strategies are employed as project design features.

2) How does climate change affect the project? Due to the global nature of climate change, this is generally forecasted in a regional manner, not a project specific manner. Potential effects of global climate change may increase wildfire hazard and decrease water supply reliability on a regional basis. These changes are discussed in Sections 3.3 and 4.1.2 of this EIR.

Global Climate Change

General Overview

Global climate change caused by GHGs is currently one of the most important and widely debated scientific, economic, and political issues in the United States. Global climate change is a change in the average weather of the Earth and can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Some data indicate that the current temperature record differs from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of GHGs at 400 to 450 ppm CO_2-equivalent concentration is required to keep global mean warming below 2°C, which is assumed to be necessary to avoid dangerous climate change (AEP 2007).

Greenhouse Gases

Gases that trap heat in the atmosphere are often called greenhouse gases, or GHGs. GHGs are emitted by natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Without these natural GHGs, the Earth's surface would be about 61°F cooler. Emissions from human activities, such as electricity production and vehicles, have elevated the concentration of these gases in the atmosphere (AEP 2007).

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas" (USEPA 2006a). The reference gas for GWP is carbon dioxide; carbon dioxide has a GWP of 1. For example, methane has a GWP of 21, which means that it has a greater global warming

effect than carbon dioxide on a molecule-per-molecule basis. One teragram of carbon dioxide equivalent (Tg CO_2e) is the emission of the gas multiplied by the GWP (1 Tg is equal to 1 million metric tons). The carbon dioxide equivalent is a good way to assess emissions because it gives weight to the GWP of the gas. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 2.1-3. As shown in the table, GWP ranges from 1 (carbon dioxide) to 23,900 (sulfur hexafluoride).

GHG Inventory

In 2004, total global GHG emissions were 20,135 Tg CO_2e, excluding emissions/removals from land use, land use change, and forestry (UNFCCC 2006). In 2004, the United States contributed the most GHG emissions (35% of global emissions). In 2004, GHG emissions in the United States were 7,074.4 Tg CO_2e, an increase of 15.8% from 1990 emissions (AEP 2007).

California is a substantial contributor of global GHGs as it is the second largest contributor in the United States and the sixteenth largest in the world). In 2004, California produced 492 Tg CO_2e (AEP 2007), approximately 7% of U.S. emissions. The major source of GHG in California is transportation, contributing 41% of the state's total GHG emissions. Electricity generation is the second largest source at 22% (AEP 2007).

Existing On-Site Conditions

Background

There are no existing uses on the project site that emit GHG emissions, since the existing physical conditions are generally vacant and characterized by mature chaparral vegetation.

Natural vegetation and soils temporarily store carbon as part of the terrestrial carbon cycle. Carbon is assimilated into plants and animals as they grow and then dispersed back into the environment when they die. There are two existing sources of carbon storage on the Merriam Mountains site: natural vegetation and soils (CTG Energetics 2007).

Natural Vegetation

Living vegetation stores carbon, but it is not possible to definitively quantify net changes in carbon storage associated with the Merriam Mountains development. The key issue is the balance between the loss of natural vegetation and future carbon storage associated with landscaping and residential development. For example, the community's landscaping palette will feature shrubs and trees, which may provide equal or greater carbon storage on a per-acre basis. The situation is further complicated by changes in fire regime. Carbon in natural vegetation is likely to be released into the atmosphere through wildfire every 20 to 150 years. Carbon in

landscaped areas will be protected from wildfire. The balance between these factors will influence the long-term carbon budget on the site (CTG Energetics 2007).

Soils

The majority of carbon within the site is stored in the soil. Soil carbon accumulates from inputs of plant and animal matter, roots, and other living components of the soil ecosystem (e.g., bacteria, worms). Soil carbon is lost through biological respiration, erosion, and other forms of disturbance. Overall, soil carbon moves more slowly through the carbon cycle, and it offers greater potential for long-term carbon storage. Field observations suggest that urban soils can sequester relatively large amounts of carbon, particularly in residential areas where management increases inputs to the soil and reduces disturbance. Observations from across the United States suggest that cities in warmer and drier climates (e.g., San Diego) may have slightly higher soil organic matter levels when compared to equivalent areas before development (CTG Energetics 2007).

The existing conditions of the vacant project site, which includes soils and natural vegetation, is the baseline for the GHG analysis in this section.

2.1.2 Guidelines for the Determination of Significance

Air Quality – Criteria Pollutants

The County of San Diego uses Appendix G.III of the State CEQA Guidelines as the basis for the following guidelines for determining significance. The project would:

1) Obstruct or conflict with implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP)

2) Result in emissions that would violate an existing air quality standard or contribute substantially to an existing or projected air quality violation of federal and state air quality standards

3) Expose sensitive receptors (e.g., schools, hospitals, resident care facilities, and/or day care centers) to substantial pollutant concentrations

4) Create objectionable odors affecting a substantial number of people

5) Cause a cumulatively considerable net increase in any criteria pollutant for which the San Diego Air Basin (SDAB is in non attainment under applicable federal or state ambient air quality standards including PM10, PM2.5 or exceed quantitative thresholds for O3 precursors, oxides of nitrogen (NOx) and Volatile Organic Compounds [VOCs]).

Air Quality – Climate Change

6) Interfere with the State of California's ability to achieve GHG reduction goals and strategies as identified in AB-32 and Executive Order S-01-07.

Guideline Sources

The identified Guidelines are based on Appendix G of the State CEQA Guidelines, the Federal Clean Air Act and State and local air pollution control programs. Guidelines Nos. 1, 2, and 5 are intended to prevent adverse effects on the public health and welfare by protecting human health with an adequate margin of safety (primary standards); Guideline No. 3 is intended to identify acceptable/unacceptable levels of potential public health (i.e., cancer) risk related to the generation of toxic air contaminants (TACs). Guideline 4 focuses on protecting property and the public welfare (secondary standards).

Guideline 6 appropriately reflects the California Legislature's determination of the steps necessary to respond to the threat of climate change. This Guideline is consistent with the most recent guidance on conducting climate change analysis under CEQA. The analysis focuses on whether the Project is consistent with AB 32 goals, which identify that GHG emissions should be reduced to 1990 levels by 2020. According to the San Diego County Greenhouse Gas Inventory (SDCGHGI) prepared by the Energy Policy Initiatives Center at the University of San Diego in 2008, the region must reduce its GHG emissions by almost 33% from BAU to achieve 1990 GHG levels by the year 2020.

2.1.3 Analysis of Project Effects and Determination of Significance

2.1.3.1 Air Quality – Criteria Pollutants

The proposed Merriam project includes both construction and operational impacts. Construction impacts include emissions associated with the construction of the project. Operational impacts include emissions associated with the proposed project land uses and traffic at full build-out.

Guideline 1: Obstruct or Conflict with RAQS or SIP

Projects that propose development consistent with the growth anticipated by the general plans would be consistent with the RAQS and SIP. Projects that are consistent with the SIP rules (i.e., the federally approved rules and regulations adopted by the APCD) are also consistent with the SIP. Projects required to conform with measures adopted in the RAQS (including use of low-VOC architectural coatings, use of low-NO_x water heaters, and compliance with rules and regulations governing stationary sources) would comply with all applicable rules and regulations adopted by the APCD.

The proposed project includes a General Plan Amendment and is proposing denser development than accounted for in the current San Diego County General Plan for this site and, therefore, in the SIP. To evaluate the net change in emissions that would result from the proposed project in comparison to existing General Plan land uses included in the RAQS and SIP, operational emissions were calculated for both the proposed land uses and those included in the existing General Plan for the project site. The existing General Plan land uses for the project site include, 345 dwelling units, 3.5 acres of general commercial and 27.2 acres of industrial use. Based on the existing General Plan land uses development on the project site would generate 13,780 ADT. The proposed project in contrast would amend the General Plan to include 2,700 dwelling units and 10 acres of neighborhood commercial and these land uses would generate 35,518 ADT, an increase of 21,738 ADT from what is anticipated in the General Plan and therefore in the SIP.

The net change in emissions from the proposed project and those included in the RAQS/SIP based on the existing General Plan is presented in Table 2.1-4. As seen in Table 2.1-4, incremental emission increases associated with the proposed project in comparison with the existing General Plan would be within screening thresholds for ozone precursors with the exception of CO and VOCs. As seen below under Guideline 2, CO impacts from the proposed project would be less than significant as no CO hot spots would result. VOC emissions above screening thresholds would not result in an exceedance of the ozone standard because the emissions are below the daily emissions in the air basin for mobile and stationary sources contained in the SIP attainment demonstration. In addition, emissions would decrease with time due to increasingly stringent air quality standards and the project would not be fully occupied until after air more stringent air quality standards are implemented. Therefore, emissions associated with the project would not obstruct or conflict with the RAQS and SIP and impacts would be less than significant.

Guideline 2: Violate an Existing Air Quality Standard

Construction Emissions

Construction activities (including dust emissions from soil disturbance, combustion pollutants from on-site construction equipment and from off-site trucks hauling dirt, cement, or building materials) would create an addition of pollutants to the local airshed.

Construction emissions would include emissions associated with CO, VOCs, NOx, SOx, PM_{10}, and PM2.5 from fugitive dust, heavy construction equipment, and construction workers commuting to and from the site.

Diesel engines emit a complex mixture of air pollutants, mainly composed of gaseous and solid materials. Visible emissions in diesel exhaust include particulate matter composed of carbon particles. In 1998, California identified diesel particulate matter as a TAC. According to CARB,

emissions from diesel engines are responsible for the majority of the potential airborne cancer risk in California. The major sources of diesel particulate matter are diesel-fueled vehicles.

In September 2000, CARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce diesel emissions and the associated health risk by 75% in 2010 and 85% by 2020. The plan identifies 14 measures that have been or will be developed to: establish more stringent emission standards for new diesel-fueled engines and vehicles; establish retrofit requirements for existing engines and vehicles where technically feasible and cost-effective; require the sulfur content of diesel fuel to be reduced to enable the use of advanced diesel particulate matter emission controls; and evaluate alternatives for diesel-fueled engines and vehicles.

For new on-road vehicles and off-road equipment, the diesel risk reduction plan includes measures for engine standards that will reduce diesel particulate matter emissions by at least 90%. For existing diesel engines and vehicles, the plan envisions the installation of retrofit control technology that can reduce diesel particulate matter emissions by at least 85%. The grading phase of development uses the largest amount of heavy-duty construction equipment and is the primary source of emissions during construction. In addition to the emissions associated with operation of construction equipment, drilling and blasting and worker commute trips would contribute a small amount of emissions.

To estimate maximum daily and total annual emissions for simultaneous construction activities, it was assumed that the following activities would occur in a single day/year: underground utilities construction, grading (including excavation, drill and blast, and finish grading), house construction, commercial buildings construction, and recreational facility construction[1].

For the purpose of estimating emissions from the application of architectural coatings, it was assumed that water-based coatings would be used for both exterior and interior surfaces and coatings would be applied using electrostatic spray guns and/or brushes. It was assumed that the architectural coatings application would take place during the residence construction phase. The methodology presented in CEQA Air Quality Handbook was used to estimate emissions from the use of water-based coatings.

The project would utilize explosives to conduct blasting activities on site. The Air Quality Technical Report identified the calculated fugitive dust emissions to be approximately 191

[1] As indicated in Section 1.0, Project Description, the project proposes five construction phases (Phase A through E) as seen in Figure 1.1-20. For purposes of evaluating the potential for significant impacts, the maximum daily construction requirements were identified on a per-phase basis. It was assumed that construction equipment, workforce, and site disturbance would be similar for each of the five construction phases. The construction analysis therefore represents worst-case evaluation of the potential maximum daily emissions associated with project construction.

lbs/day (see Table 2.1-5a). The estimated maximum daily emissions due to the use of explosives would be 335 lbs/day of CO and 85 lbs/day of NOx (see Table 2.1-5a).

In addition, site preparation would include grading activities which were estimated in the Air Quality Technical Report to generate 196 lbs/day of PM_{10} emissions, as shown in Table 2.1-5a. Emission from heavy equipment exhaust was estimated to generate 191.85 lbs/day of CO, 62.16 lbs/day of VOCs, 1,210.42 lbs/day of NOx, 176.9 lbs/day SOx, and 29.85 lbs/day of $PM_{10}$and 26.57 lbs/day of $PM_{2.5}$.

The maximum emissions for these pollutants were calculated and are shown in Tables 2.1-5a through 2.1-4f: 761.47 lbs/day for CO, 147.55 lbs/day of VOCs, 1,654.88 lbs/day for NOx, 224.25 lbs/day for SOx, 578.02 lbs/day for PM_{10}, and 171.74 lbs/day for $PM_{2.5}$. The screening level thresholds are set at 550 lbs/day for CO, 75 lbs/day for VOCs, 250 lbs/day for NOx, 250 lbs/day for SOx, 100 lbs/day for PM_{10}, and 55 lbs/day for $PM_{2.5}$; therefore, the emissions associated with project construction activities are above the screening-level thresholds for the maximum construction scenario for CO, VOCs, NOx, PM_{10}, and $PM_{2.5}$ and would pose a significant impact on the ambient air quality during the approximate 8 to 10 years of construction (Impact AQ-2).

Because emissions of CO were above the thresholds, emissions were modeled to evaluate off-site 1-hour and 8-hour impacts and evaluate whether the NAAQS or CAAQS for CO would be exceeded. The modeling analysis indicated that the maximum 1-hour impact would be 7,710.05 µg/m3 or 6.74 ppm, which when added to the maximum 1-hour background concentration over the past three years (excluding the Cedar fire event) of 6.3 ppm would be 13.04 ppm, which is below the CAAQS of 20 ppm and the NAAQS of 35 ppm. Likewise, the maximum 8-hour impact would be 1,533.49 µg/m3 or 1.34 ppm, which when added to the maximum 8-hour background concentration of 3.61 ppm would be 4.95 ppm, which is below the CAAQS and NAAQS of 9 ppm. Therefore, this more detailed analysis indicates that construction generated CO emissions would be less than significant. The CARB has implemented a program under Title 13, California Code of Regulations, Sections 2281-2285 and Title 17, California Code of Regulations, Section 93114 that requires sellers of diesel fuel to meet a 15 ppm sulfur limit for all vehicular diesel sold in California. This requirement also applies to non-vehicular diesel fuel with the exception of locomotive and marine vessel fuels, which are regulated by other requirements. The low-sulfur diesel fuel requirement will reduce emissions of particulate matter from all diesel sources from construction equipment. The project will be constructed using low-sulfur diesel fuel because construction will commence after the fuel is available on the market. The use of low-sulfur fuel has been included as an Environmental Design Consideration (see EIR Section 8.0). The use of low-sulfur fuels would reduce construction related emissions; however, impacts would not be reduced to a level below significance for NO_x,VOCs, PM_{10} and $PM_{2.5}$ (refer to Impact AQ-2).

Operational Emissions

Operational emissions would include emissions associated with CO, VOCs, NO_x, SO_x, PM_{10}, and $PM_{2.5}$ generated by the proposed project which would be associated with traffic accessing the project site, and with area sources such as fireplaces, landscaping, and energy use for the residential and commercial uses.

Based on the evaluation of air emissions from project operations, emissions would exceed quantitative emissions thresholds for CO and VOCs in 2015 (see Table 2.1-6). SOx, NO_x, PM_{10}, and $PM_{2.5}$ are below screening-level thresholds for operational emissions in 2015 and 2040, and therefore these operational impacts would be less than significant based upon CARB projected emissions. Vehicular emissions are projected to decrease over time with the phase-out of older vehicles and implementation of the increasingly stringent emissions controls including CO and VOCs. The project is not likely to complete build-out of Phase I by 2015 due to current project entitlement status, estimated time needed to process final plans and permits, and current market conditions. Ultimate buildout of all five phases of the project by 2015, as assumed in the air quality study, is a very conservative assumption as it would require entitlement processing and required permits to be competed within six years for all five phases. A more likely scenario is that initial vehicle trips will be generated by the project in the post-2015 time frame and that ultimate buildout will occur in the post-2020 timeframe, at the same time increasingly stringent emission controls are being implemented.

A more realistic buildout and absorption schedule has been developed by the Project Applicant. To provide a more realistic assessment of operational emissions, annual vehicle trips were estimated for each year from 2014 through 2021 and the emissions modeling for VOC was updated (Scientific Resources Associated, ROG Emissions Memorandum, August 2009).

Several Project Design Features included (see Table 2.1-12) as part of the proposed project reduce project-generated ADT and associated vehicle emissions by approximately 7.9% (Scientific Resources Associated, ROG Emissions Memorandum, August 2009). Based on the updated emissions calculations reflecting the Project Applicant's implementation schedule and incorporation of the proposed Project Design Features included in Table 2.1-12, VOC emissions are below the screening level criteria of 75 lbs/day for daily emissions and 13.7 tons/year for annual emissions (Scientific Resources Associated, ROG Emissions Memorandum, August 2009). Therefore, potential impacts resulting from VOC's would be less than significant.

As shown in Table 2.1-7, the projected emissions would be below the screening level thresholds for all emissions with the exception of CO (882.60 lbs/day in 2040), which is above the screening threshold of 550 lbs/day. Since CO emissions associated with the project were estimated to be above the screening-level thresholds for CO, to further evaluate whether the project would result in a significant impact, additional analysis for criteria pollutants that exceed

the screening-level thresholds was conducted. This analysis was conducted in accordance with Caltrans guidelines to evaluate "CO hotspots" emissions that would cause a ground-level exceedance of the NAAQS or CAAQS for CO. To verify that the project would not cause or contribute to a violation for the CO standard, a screening evaluation of the potential for CO hot spots was conducted. In accordance with the protocol, CO hot spots are typically evaluated when the level of service of an intersection or roadway decreases to "E" or worse; signalization and/or channelization is added to an intersection; and sensitive receptors such as residences, commercial developments, schools, or hospitals are located near the affected intersection or roadway segment. The Traffic Impact Analysis evaluated whether there would be a decrease in the level of service at the roadways and/or intersections affected by the project. As discussed in Section 2.2 of this EIR, "Transportation/Traffic," roadways and intersections affected by the project have been mitigated to LOS D or better within the County of San Diego. However as identified in the Section 2.2.9 of the EIR, mitigation measures related to intersection improvements in the City of San Marcos, City of Vista, and Caltrans were determined to be infeasible since there is no guarantee that the respective jurisdiction will implement the identified improvements. Without improvements, the intersections in the City of Vista, City of San Marcos and/or Caltrans would not operate at an acceptable LOS.

To evaluate the potential for CO "hot spots," for intersections that would operate below LOS in the event the improvements are not completed, the procedures in the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998) were used. As recommended in the Protocol, CALINE4 modeling was conducted for the intersections located outside of the County of San Diego's jurisdiction for the scenario without project traffic, and the project scenarios. The CO "hot spots" analysis conducted for intersections located within the City of San Marcos, City of Vista and Caltrans concluded that the projected operation of these intersections absent mitigation would not contribute to a violation of the CO standard. The predicted CO concentrations are below the 1-hour and 8-hour NAAQS and CAAQS for CO (see Appendix D to this EIR). Therefore, no exceedance of the CO standard is predicted, and the project would not cause or contribute to a violation of an air quality standard and impacts from CO would be less than significant.

Project Design Considerations Related to Criteria Pollutants

To further reduce vehicular emissions associated with the proposed project the following Travel Demand Measures have been included as environmental design considerations for the proposed project (see EIR Section 8.0): traffic systems management such as coordinated traffic signals, carpools/vanpools by maintaining a database of the work place of each resident and matching residents to carpools/van pools and ride-share/bus shelters at internal locations that would enhance service to the existing Deer Springs park-and-ride facility and will likely encourage carpooling and carpooling. In addition, the proposed project's location in the central portion of

the County and near to major employment centers and transportation corridors creates the opportunity for residents to shorten their commutes and reduce aggregate vehicle miles traveled.

As mentioned above, in addition to vehicular emissions, operational impacts are also associated with energy uses which were estimated based on the South Coast Air Quality Management District's (SCAQMD) emission factors for residential and commercial uses. As identified in Tables 2.1-6 and 2.1-7, CO emissions were calculated to be 0.00899 lbs/day for residential uses and 2.85 for commercial uses.

Environmental design considerations have been included as an element of the proposed project and would reduce both commercial and residential energy use (which reduces criteria pollutants and GHG emissions). These project design features are part of the GHG reduction measures outlined in Table 2.1-12. As discussed in EIR Section 8.0, these design considerations include:

(1) Photovoltaic units for 20% of suitable single-family dwelling units will be provided, which are generally designed to last 30 years.

(2) Prior to occupancy, residential builders will demonstrate that the project has been developed in accordance with the California Green Builder Program (CGB) through the home builder submitting a completed CGDB application to the CGB program coordinator. The CGB program coordinator will review the submitted application and verify compliance with the CGB requirements. Upon application approval the project will be scheduled for a CGB certified inspector to ensure the project has met the CGB requirements. Per the inspections completed the CGB will provide certification that the structures have met the requirements.

(3) Residences will achieve energy performance equivalent to 25% better than current Title 24 standards.

(4) Prior to occupancy, commercial structures will be required to achieve a minimum Silver certification under the U.S. Green Building Council's LEED for Core and Shell (LEED-CS) program. The project will be required to submit a scorecard to become registered as a LEED-CS, which is a formal recognition by the USGBC given to a project. The USGBC will provide a letter that details the terms and conditions for LEED-CS certification.

(5) Where feasible, commercial structures will use cool roof technologies and light-colored paving (CARB Early Action Measure/Energy Efficiency 2-9).

(6) Commercial buildings will achieve energy performance equivalent to 25% better than current Title 24 standards, which will be demonstrated as part of the LEED-CS standards identified above.

(7) Builders will offer residents their choice of energy-efficient appliances (including washer/dryers, refrigerators), and appliances installed by builders will be Energy Star (including dishwashers) or equivalent.

(8) The project will not install wood-burning fireplaces for heating purposes.

Guideline 3: Sensitive Receptors

Operational Emissions

Sensitive receptors are typically defined as residential units, day care centers, educational facilities, residential care facilities, and hospitals. Sensitive receptors in the project vicinity have been identified as residential uses along Deer Springs Road, Sarver Lane, and Champagne Boulevard. Truck traffic on I-15 has not been evaluated, as truck traffic on I-15 would occur regardless of project implementation. Localized truck traffic associated with project operations would be closer to receptors and would therefore have a potentially higher impact on surrounding receptors. The health risk associated with operational impacts was less than significant (0.0138 in a million as opposed to a significance threshold of 10 in a million) for both onsite and existing offsite residences. Figure 1 provided in Appendix D of the Air Quality Technical Report identifies the sources and location of sensitive receptors. It should be noted that the prevailing winds tend to transport emissions toward the east, because the prevailing winds in San Diego County are westerly winds.

Mitigation measures included in EIR Section 2.2 will mitigate direct traffic impacts generated by the proposed project and all intersection operations will be improved to LOS D or better. However, as identified in the Section 2.2.9, mitigation measures related to intersection improvements in the City of San Marcos, City of Vista, and Caltrans were determined to be significant and unavoidable since there is no guarantee that the respective jurisdiction will implement the identified improvements. A CO “hot spots” analysis was completed to determine whether the potential for CO “hot spots,” for intersections that would operate below LOS in the event the improvements are not completed. The CO “hot spots” analysis conducted for intersections located within the City of San Marcos, City of Vista and Caltrans concluded that the projected operation of these intersections absent mitigation would not contribute to a violation of the CO standard. Therefore, no CO “hot spots” are anticipated due to project-related traffic.

The proposed project would generate CO emissions above the significance thresholds in 2015 and 2040. To further evaluate whether these emissions would result in a violation of an air quality standard, a CO hot spots evaluation was conducted. which concluded that the project would be within allowable limits and no CO hot spots would result from implementation of the proposed project (see Appendix D to this EIR).

Construction Emissions

Diesel exhaust particulate matter ($PM_{2.5}$) is known to the State of California to contain carcinogenic compounds. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure defined as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Diesel exhaust particulate matter would be emitted during construction due to the operation of heavy equipment at the site.

San Diego County identifies an excess cancer risk level of one in 1 million or less for projects that do not implement T-BACT and an excess cancer risk level of 10 in 1 million or less for projects that do implement T-BACT. These significance thresholds are consistent with the APCD's Rule 1210 requirements for stationary sources. If a project exceeds these thresholds then it would be deemed to have a significant impact. The Air Quality Technical Report predicted that the maximum excess cancer risk would be 3.85 in a million and T-BACT must be implemented to avoid a significant impact. The County of San Diego recommends consideration of diesel particulate filters, oxidation catalysts, and repowered engines as T-BACT. With use of 25% of the construction fleet retrofit and/or repowered and idling restrictions to limit idling to less than 15 minutes, the project would comply with T-BACT, and the risk would be below the County of San Diego's significance threshold of 10 in 1 million with application of T-BACT (see Section 2.1.6).

The proposed project is a master planned community and would be constructed in phases over an 8- to 10-year period. Construction activities would occur intermittently over this period as the development is phased and constructed. The analysis demonstrates that, . with the T-BACT measures listed below, construction emissions impacts to sensitive receptors from diesel exhaust particulates would be less than significant.

Project Design Considerations

1. On-site generators, including the rock crusher generator, will be required to comply with permitting requirements established by the APCD, including compliance with the Airborne Toxic Control Measure for Stationary Compression Ignition Engines established by CARB.

2. As discussed above the project will utilize low-sulfur fuels during construction per the requirements implemented by the CARB for 15 ppm sulfur diesel. Based on the amount of contractors whose fleets have already been retrofitted and engines repowered as a result of the local and neighboring Carl Moyer programs, 10% of the construction fleet will use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters, and/or CARB-certified Tier I, II, and III equipment.

3. Consistent with CARB idling time restrictions, heavy-duty diesel equipment will be limited to idling periods of 15 minutes or less throughout construction.

It should be noted that cancer risk calculations are based on point sources of pollutants and assume exposure to be 24 hours per day, 7 days per week, for 70 years. When applied to construction, which is a temporary source, actual risks to individuals would actually be lower. The Merriam project is a master planned community and would be constructed in phases over an 8–10 year period. Construction activities would occur intermittently over this period as the development is phased and constructed. With implementation of T-BACT, impacts to sensitive receptors from diesel exhaust particulates would be less than significant.

Silica Dust

Background. There are no CEQA significance guidelines for environmental exposure of nearby receptors to airborne crystalline silica generated by construction activities. In general, project construction is relatively short-term and does not approach the durations required to experience health hazards from silica dust exposure (Crystalline Silica Exposure Memorandum, August 3, 2009). Compared to active quarry sites where silica monitoring has been done by the South Coast Air Quality Management District, construction activities with required dust management would not generate silica dust at high enough concentrations to cause health hazards on adjacent properties. In the absence of empirical evidence demonstrating silica hazards on residential properties in the vicinity of activities that generate silica dust, no thresholds have been established for construction projects.

Silicosis is a chronic disease of the lungs and caused by the continued inhalation of silica dust over a period of years. It is generally considered to be an occupational hazard, primarily limited to workers in the mining and construction industries. Chronic silicosis is caused by prolonged exposure to silica dust in the workplace; acute silicosis is caused by shorter-term exposure to high concentrations of silica particles.

Silicosis and other respiratory problems associated with exposure to silica dust are known to occur after long-term exposure. In 2005, the California Office of Environmental Health Hazard Assessment (OEHHA) established a chronic reference exposure level (REL) of 3 µg/m3 as the level below which no adverse health effect would be anticipated if individuals were indefinitely exposed to that level. The REL was derived from data obtained from epidemiological studies of occupational exposure to crystalline silica in various workplace environments, including gold mining, diatomaceous earth workers, and tin mining. In each of the studies, workers were exposed in close proximity to activities that would generate crystalline silica. To date, no studies have demonstrated that adverse health effects would result from environmental exposure of the general public to crystalline silica; therefore the REL is highly protective of the general public Note that because the construction site is required to maintain the air quality in conformance

with OSHA requirements, off-site receptors would also be protected by the dust control measures.

The REL is based on chronic exposure; according to OEHHA's definition of chronic exposure, the exposure period of concern in the development of chronic RELs is a full lifetime. From a practical standpoint, OEHHA considers chronic exposure for humans to be greater than 12% of a lifetime of 70 years, or greater than 8 years.

OEHHA has not established an acute REL for short-term exposure because OEHHA has not identified any adverse health effects associated with short-term environmental exposure to crystalline silica (Crystalline Silica Exposure Memorandum, Scientific Resources Associated, August 2009). The potential adverse health effects that have been determined to be the result of long-term exposure to crystalline silica do not pertain to exposure from construction activities.

The activities that have been identified by the Occupational Safety and Health Administration (OSHA) as a source of crystalline silica that would be occurring at the project site would be the rock drilling and processing areas that would be located at various points throughout the project site (see FEIR Figures 1.1-20 and 2.4-10). Construction activities will generally occur in five phases in separate geographic locations. Rock crushing and blasting will be required for all phases of the project construction for approximately 280 to 320 working days for a maximum duration of 18 months in any phase and at any one location. This represents 18.75% of the duration considered to be representative of chronic exposure by OEHHA. Therefore, while construction activities would be occurring at the project site over an 8 to 10 year period, activities would move throughout the site and would not result in a chronic exposure timeframe at any one location.

The potential for residents within the vicinity of the project site to be subjected to silica dust is very low due to required dust management during construction and air dispersal patterns of particulates in the PM_4 size range. This is why health concern regarding silica dust is primarily concerned with construction workers since they are exposed to the airborne particles.

As noted above, occupational exposure to respirable crystalline silica is an irreversible but preventable health hazard (Department of Health and Human Services 2002). OSHA and the National Institute of Occupational Safety and Health (NIOSH) recommend the implementation of measures to reduce the possibility of exposure to crystalline silica at the work site as adverse health effects may result from long-term exposure to crystalline silica dust for workers. Measures that may be implemented during construction to ensure worker safety, include dust control systems, routine air monitoring, the use of respirators, and employee training. OSHA employs a "threshold limit of emissions" for airborne contaminants that projects are required to abide by. To comply with the required emission limits, OSHA recommends administrative or engineering controls be used when feasible. The project site will be required to follow OSHA's prescribed

threshold limits of airborne contaminants. Preventative measures will be utilized to comply with the REL for crystalline silica for workers..

Therefore based on the information provided above, the risk of adverse health effects from exposure to silica dust for people living nearby would be extremely low because, (1) the project site is required to have OSHA administrative and engineering controls for airborne contaminants; (2) the project site is required to have measures to comply with the REL for crystalline silica for workers; and (3) nearby residents would rarely be exposed to levels above the REL, if at all, and (4) if residents were to be exposed to levels above the REL, the duration would be far less than the REL period of concern (8 years or more).

Guideline 4: Objectionable Odors

During construction, diesel equipment operating at the site may generate some nuisance odors. However, due to the distance of sensitive receptors to the project site and the nature of construction, odors associated with project construction would not be significant.

The project is a residential and commercial development that could produce objectionable odors; however, they would only be in trace amounts and localized to the immediate surrounding area. According to the County of San Diego's Zoning Ordinance, Section 6318, "all commercial and industrial uses shall be so operated as to not emit matter causing unpleasant odors which are perceptible by the average person at or beyond any lot line of the lot containing said uses." In general, this ordinance applies to commercial and industrial land uses following development. In the event of release of odor compounds, the County of San Diego requires a dilution factor ratio of one volume of odorous air to eight or more volumes of clean air; however, due to the residential and commercial nature of the project, no significant odorous air emissions are anticipated from normal operations at the Merriam Mountains development. Odor impacts are therefore less than significant.

Guideline 5: Cumulatively Considerable Net Increases in Criteria Pollutants that are in Non Attainment

Please refer to EIR Section 2.1.4, "Cumulative Impact Analysis."

2.1.3.2 Air Quality – Climate Change

Guideline 6: Interfere with Ability to Achieve GHG Reduction Goals and Strategies

Climate change is a global issue, caused by the cumulative effects of individual decisions. Typical development projects contribute incrementally to climate change with no measurable individual direct impacts. The State of California's GHG reduction goals will be achieved through the cumulative and combined efforts of all industries, including development.

To determine whether the proposed project would interfere with the State of California's ability to achieve GHG reduction goals and strategies as identified in AB-32 and Executive Order S-01-05, a GHG inventory was completed that quantifies GHG emissions from the proposed project with and without incorporation of project design features. According to the state, the baseline for the analysis is "business as usual" (BAU) as characterized in the State of California's GHG reduction goals and strategies. For a project such as Merriam Mountains, BAU is characterized as a project consistent with existing Title 24 standards.

According to the San Diego County Greenhouse Gas Inventory (SDCGHGI) prepared by the Energy Policy Initiatives Center at the University of San Diego in 2008, the region must reduce its GHG emissions by almost 33% from BAU to achieve 1990 regional emissions levels by the year 2020. While it is uncertain how the rapidly growing San Diego region will address AB 32 goals, a project such as Merriam Mountains would need to reduce emissions by 33% below existing 24 standards to meet estimated regional percentages.

An evaluation of whether the project would meet the goals of 2050 has not been completed at this time because it is not clear what strategies will be needed to meet the overall long-term reduction goals set for 2050 and how an individual project like Merriam Mountains would interfere with achieving these goals. Using 2050 for purposes of analyzing whether or not the project would interfere with the State of California's ability to achieve GHG reduction goals and strategies would be well beyond even the buildout horizon for the Merriam project. In addition, it is unknown what contributions early actions identified by the state would make to achieving 2050 reduction goals and strategies and what contributions would be expected by a project such as Merriam Mountains. For these reasons, as noted above, analysis of the project with respect to 2050 goals was considered too speculative and thus was not conducted. However, the State has determined that achievement of 2020 goals will put the State on the path of meeting 2050 goals as well.

Build-out GHG Emissions Inventory and Methods

The GHG Protocol Corporate Standard (World Business Council for Sustainable Development and World Resources Institute 2001) provides standards and guidance for companies and other organizations preparing a GHG emissions inventory. The standard is written primarily from the perspective of a business developing a GHG inventory. The GHG Protocol provides the accounting framework for nearly every GHG standard and program in the world, from the International Standards Organization to the European Union Emissions Trading Scheme to the California Climate Registry, as well as hundreds of GHG inventories prepared by individual companies.

The protocol divides GHG emissions into three scopes, ranging from GHGs produced directly by the business to more indirect sources of GHG emissions, such as employee travel and

commuting. For purposes of this analysis, the direct and indirect emissions are separated into three broad scopes:

- **Scope 1.** Direct GHG emissions
- **Scope 2.** Indirect GHG emissions from consumption of purchased electricity, heat, or steam
- **Scope 3.** Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities, electricity-related activities (e.g., transmission and distribution losses) not covered in Scope 2, outsourced activities, and waste disposal.

Using the GHG Protocol, GHG emissions associated with the Merriam Mountains project were estimated separately for four categories of emissions: commercial development, residential development, water consumption, and transportation.

The inventory assumed full implementation of the California Renewable Portfolio Standard (California Senate Bill No. 1078, or SB 1078) (33% renewable electric power by 2020). SB 1078 is a state policy that requires electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date. A utility reduces GHG emissions by replacing fossil fuel–generated energy with GHG-free sources, such as wind and photovoltaics. This is a baseline estimate assuming Title 24-compliant buildings and mandated improvements in the statewide electricity supply (e.g., implementation of an expanded Renewable Portfolio Standard).

The complete emissions inventory, prepared by CTG Energetics, Inc., is summarized below, and is included as Appendix Y to this EIR. The emissions inventory quantifies estimated commercial, residential, water, transportation, and construction emissions at build-out and during phased project construction. The phased construction analysis incorporates incremental implementation of state-mandated emissions reductions, including SB 1078.

SB 1078 established the Renewal Portfolio Standard program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 33% by 2020. The California Public Utilities Commission (CPUC) accelerated the goal, requiring utilities to obtain 20% of their power from renewable sources by 2010 (SB 107). Currently, CPUC is considering ways to achieve 33% renewable energy by 2020 and is working collaboratively with the California Energy Commission to implement the Renewable Portfolio Standard program.

Commercial Emissions

The Merriam Mountains Specific Plan calls for 110,000 square feet of commercial space. Baseline GHG emissions associated with these buildings were estimated based on the average electricity consumption for commercial buildings in the Cal-Arch database (a publicly available product from Lawrence Berkeley National Laboratory based on California's End Use Survey). Annual electrical usage was multiplied by the estimated 2020 grid carbon coefficient for electricity purchased from San Diego Gas & Electric Company (SDG&E) to estimate metric tons of CO_2e per year. The estimated 2020 grid carbon coefficient is based on planned reductions in carbon emissions associated with the SB 1078 Renewable Portfolio Standard.

Residential Emissions

The Specific Plan proposes 2,700 residential dwelling units. Emissions estimates were developed for three classes of residential units, including multi-family, single-family attached, and single-family detached. Specifications for each type were based on preliminary design prototypes, including information describing average size (square feet) and the number of bedrooms per dwelling unit (CEC 2003). These specifications were used to apply observed energy use statistics for Title 24-compliant residential buildings from the California Energy Commission to estimate annual electricity and natural gas usage for each dwelling unit.

Residences were assumed to use purchased electricity for cooling, appliances, and plug-loads and natural gas for cooking and water heating. Baseline energy use was calculated as a function of kWh per square foot based on average performance for Southern California residences compliant with Title 24 (2005) standards. Each home was assumed to have one standard refrigerator. Energy use for clothes washing, dishwashers, and plug loads was based on observed performance data and estimated as a function of the number of bedrooms (CEC 2003). Household electrical use was multiplied by GHG emissions coefficients for the SDG&E grid (USEPA Power Profiler and eGRID database), assuming a 14% reduction in GHG intensity associated with implementation of the state-mandated Renewable Portfolio Standard by 2020 (SB 1078). The phased construction inventory presented later in this section provides information regarding project emissions along with incremental implementation of the Renewable Portfolio Standard.

Natural gas use was estimated based on average gas consumption per square foot observed for Title 24-compliant Southern California homes. Natural gas consumption was multiplied by the U.S. Department of Energy emissions coefficients for CO_2 per therm. CO_2 for household electricity and natural gas use were combined from all dwelling units and converted to metric tons for reporting.

Water

Water use and energy use are often closely linked. The provision of potable water to commercial users and 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 project will have an embodied energy of 2,779 kWh/acre-foot or 0.0085 kWh/gallon (Torcellini et al. 2003). Water demand estimates were based on the *Master Plan of Water for the Merriam Mountains Project* (Dexter Wilson Engineering, Inc. 2006). GHG emissions were calculated based on an average consumption of 1.32 million gallons per day at project build-out. The embodied energy demand associated with this water use was converted to GHG emissions with the same electrical grid coefficients as the other purchased electricity.

Transportation

Mobile source GHG emissions were estimated for the community's residential population. Mobile source emissions for this GHG inventory were estimated based on the project Traffic Analysis (LLG 2007). The study estimated future average daily trip (ADT) generation per neighborhood within the community. Information from the U.S. Census Bureau was used to estimate average trip length for Southern California residents in 2020. Based on trends over the last 20 years, a long-term average increase in vehicle miles traveled (VMT) of 1.6% per year was assumed, which yields a 2020 average trip length of 6.12 miles from a 2007 estimate of 4.98 miles/trip. The estimated ADT was multiplied by an estimated average distance per trip to estimate total annual vehicle miles traveled, which totals approximately 79 million vehicle miles per year for all future residents. The total miles traveled was multiplied by average fleet fuel economy (21 miles per gallon for 2007), and a coefficient representing the GHG content of gasoline in 2020 (17.608 lbs of CO_2 per gallon of gasoline, 10% lower than motor fuel in 2007) (U.S. Department of Energy). It should be noted that the assumptions are considered to be conservative since they use 2007 average fleet fuel economy and trip lengths, and these assumptions are expected to change for the better with respect to climate change effects in the coming years due to likely new fuel economy standards and driving habit changes associated with fuel price increases. Reflecting the current policy situation, these calculations assume full implementation of the mandated California Low Carbon Fuel Standard (State of California 2007) with no change in average fuel economy. Transportation-related GHG emissions are estimated to be 29,865 and 33,269 metric tons CO_2e per year for 2007 and 2020, respectively.

These emissions will be regulated by standards currently required and implemented at the state level. Standards that will apply to the Merriam Mountains project are summarized in Table 2.1-8.

Criteria pollutants such as particulate matter and ozone precursors associated with transportation have light-absorbing properties that can affect climate. The emissions inventory for these pollutants is presented in EIR Section 2.1.3.1, "Air Quality – Criteria Pollutants." CalEPA notes

that the science to characterize the net climate effects of particulate matter and ozone precursors is still evolving and only qualitative assessments can be made. CARB's continuing efforts to reduce emissions of these criteria pollutants as well as project-specific measures noted in Section 2.1.3.1 should provide some benefit with respect to the effects of these pollutants on global climate change.

Construction Emissions

GHG construction emissions for the Merriam Mountains project were calculated using OFFROAD emission factors for heavy equipment and EMFAC emission factors for vehicles. The URBEMIS model for CO_2 emissions was not used since it has not yet been developed for San Diego County. The results of the emissions calculations are presented in Tables 2.1-9 and 2.1-9.

Carbon Capture

The proposed project will also remove existing vegetation from the site that temporarily stores carbon as part of the terrestrial carbon cycle. Over time, residential landscaping and soils may increase carbon storage compared to predevelopment conditions; however, these gains may be offset by vegetation and soil storage lost to more extensive impervious surface areas. It is not possible to quantify the net change with specificity (CTG Energetics 2007).

Anticipated Build-out Emissions and Reductions Associated with Project Design Features

The results of the build-out emissions inventory for all estimated GHG emissions associated with the project are presented in Table 2.1-11a and 2.1-11b. GHG emissions are characterized as Scope 1, Scope 2, and Scope 3 as defined by the GHG Protocol noted above. Estimated emissions reductions, using Project Design Features discussed later in this section, are shown in Table 2.1-11a and 2.1-11b. Four reduction strategies are shown in Table 2.1-11a and 2.1-11b, each additive. Strategy 1 assumes emissions reductions associated with SB 1078. Implementation of the SB 1078 standard essentially reduces the GHG intensity of energy supplied to the community. Strategy 2 assumes SB 1078 standard plus 25% better than the Title 24 standard (less 25% purchased electricity and less 32% natural gas). This strategy reduces on-site energy demand. Strategy 3 assumes implementation of water conservation measures to achieve a 50% reduction in embodied energy from BAU consumption. Strategy 4 assumes all the features of Scenarios 1, 2, and 3 plus 20% photovoltaic penetration for the residential community (i.e., use of photovoltaic on 20% of suitable dwelling units).

Assuming full implementation of SB 1078, Merriam Mountains' energy efficiency improvements will reduce GHG emissions at build-out by 28% compared to a 2007 Title 24-compliant baseline. Furthermore, when combined, the energy efficiency improvements, water conservation measures, and 20% photovoltaic implementation will reduce transportation GHGs

by 32.4% at build-out compared to a 2007 Title 24-compliant baseline. Operational related reductions are discussed below.

Proposed Project Design Features Incorporating GHG Emissions Reductions Consistent with State of California Goals

Project design features proposed by the Project Applicant are presented in Table 2.1-12. As shown in Table 2.1-12, a wide range of project design features are incorporated in the project, ranging from water use efficiency, building energy efficiency, and landscaping to smart-growth land use patterns, solid waste diversion, and education.

Water efficiency measures include a 50% reduction in embodied energy water use over BAU (assumed to be Title 24 as noted above) through an assortment of water conservation measures, including low-water-use appliances, drought-tolerant landscaping, efficient irrigation controllers, and compact development patterns. Water-use efficiency results in energy efficiency and reduced carbon emissions, particularly in Southern California, where approximately 11% of energy consumption is embodied in water delivery and treatment.

Building energy efficiency measures include overall building energy performance equivalent to 25% below current Title 24 standards. This will be achieved through a variety of measures, including participation in the California Green Builder Program, builder-provided Energy Star appliances in single-family and multi-family units, and use of photovoltaics in 20% of single-family homes. In addition, consumer products in residences and systems used by tenants in commercial space will comply with CARB's Early Action Guidance regarding reduction of GHG emissions (California Environmental Protection Agency 2007).

Smart land-use principles incorporated in the proposed development include a mix of residential densities and product types in proximity to on-site neighborhood commercial development, location of the proposed development in proximity to employment centers, and a compact development pattern that retains natural vegetation on over 50% of the site. Transportation Demand Measures (TDMs) are incorporated in the project design as noted in Section 2.2, "Traffic," of this EIR. Among the TDMs is a project Intranet that will enable residents to communicate and coordinate regarding rideshare opportunities, which would result in a reduced number of vehicle miles travelled. The reduction would result in fewer GHG emissions associated with vehicle operations. The Project Applicant will also provide educational materials for residents and commercial tenants discussing strategies to reduce GHG emissions consistent with CARB's Early Action Guidance regarding reduction of GHG emissions.

Vehicular Emissions

While mobile source GHG emissions have been quantified, emissions reductions are addressed qualitatively not quantified. Rather, VMT-related GHG emissions are considered with respect to

the Caltrans Climate Action Plan and the SDCGHGI. Both analyses demonstrate that the project will support and not interfere with AB 32 compliance, using either the state-wide goal of 25% below BAU or the estimated regional goal of 33% BAU for on-road transportation-related emissions.

The Caltrans plan concludes that local project design features may be able to influence approximately 10 to 30% of overall GHG emissions through so-called Smart Land Use and Intelligent Transportation Systems. Caltrans describes the goal of these measures as the reduction in per capital vehicle travel, relief from congestion and improvement in travel time in congested corridors and result in "more compact, accessible, multi-modal communities where travel distances are shorter, people have more travel options, and it is possible to walk and bicycle to more destinations." The Caltrans action plan calls for "Local Development/Intergovernmental Review" to promote land use planning and development decisions that include (1) Transportation choices, including transit, intercity rail, passenger service, air service, walking, biking and (2) Community design options, including urban infill development, mixed use development and transit-oriented development.

The proposed project includes a number of features that support the Caltrans Climate Action Plan goals by improving the regional roadway network in the vicinity of the project. The project's largest contribution to reduction of on-road transportation emissions would be through improvement of roadways and intersections, relieving existing congestion and resulting in reduced idling and travels times. Additionally, the project has been designed as a mixed use development, incorporating a variety of multifamily housing types, single-family housing and on-site retail commercial uses. This design approach helps reduce trips and VMT by providing residents with retail choices close to their homes. Equally important, the project incorporates an extensive trail system, sidewalks, and bike lanes, allowing pedestrians and cyclists to access the commercial area and off-site destinations. Lastly, a number of project design features are directly aimed at reducing VMT and, therefore, GHG emissions (refer to Table 2.1-12). Although these project design features are not quantified in the reduction of on-road transportation emissions as discussed below, these features will increase reduction of GHG emissions because they would potentially reduce use of automobiles by providing alternate modes of transportation for project residents.

In addition to these project design features, the SDCGHGI estimates that on-road transportation emissions will be reduced by more than 40% through implementation of existing regulations and travel trends. The Inventory estimates that implementation of AB 1493, or the Pavley Bill, will reduce light-duty passenger vehicle emissions in California by 21% by 2020. Without implementation of the Pavley Bill, GHG reductions would be approximately 12% by 2020 under the federal CAFÉ standard. Implementation of the Low Carbon Fuel Standard (LCFS) would add another 10% reduction in GHG emissions from fuel use by 2020. The Inventory calculated a 10% reduction in VMT by 2020 due to pricing effects and changes in driver preferences. Finally,

application of CARB efficiency/hybridization strategies will reduce emissions by another 3% to 4%. (SDCGHGI September 2008).

In summary, although not quantified, the proposed project is expected to reduce GHG emissions by 10% to 30% below BAU through project design features that support implementation of the Caltrans Climate Action Plan. According to the SDGHGI, with implementation of Pavley 1 and 2, reductions in on-road transportation emissions in the San Diego region would total 46% of all emissions reductions, and would exceed the AB 32 target by 2.1 MMT CO_2e. Even without Pavley, the Inventory estimates that San Diego regional transportation emissions would exceed AB 32 targets by 1.4 MMT CO_2e (SDCGHGI September 2008). Therefore, GHG emissions from the project will be reduced by more than 35% through implementation of existing regulations, and more than 40% with implementation of the Pavley Bill.

Construction Emissions

While construction-related GHG emissions have been quantified, emissions reductions are not quantified. Construction emissions will peak during the first construction phase, reducing to zero at project buildout. There are relatively few opportunities to reduce construction emissions. For example, the list of project design features included in the CAPCOA White Paper (2008) does not include measures to reduce construction emissions. Measures that can be expected to be implemented by contractors during construction of the Merriam Mountains project are summarized below.

The OFFROAD construction fleet in California is provided by contractors, where standards must be met in order for the construction equipment to be utilized on a project site. EPA has the lead role in providing emissions standards for OFFROAD construction equipment. Construction equipment air emissions are assessed at a given "Tier" based on the amount of emission reduction included in the equipment specifications. Thus far, EPA has not adopted any regulations regarding reduction of GHG emissions on OFFROAD construction equipment. Exhaust emission standards have been provided for CO emission reductions. However, reductions in CO would not result in reductions of CO_2 because CO is a product of incomplete combustion and CO_2 would be the natural product if combustion proceeds to completion.

Recent federal engine and fuel regulations will play a role in reducing carbon emissions. Specifically, these include: (1) current U.S. EPA rules which set standards for all new on-road engines: (2) pending EPA rules requiring similar reductions for all new non-road engines (to be phased in between 2008 and 2014); and (3) federal fuels standards for low sulfur and ultra low sulfur. This combination of engine and fuel standards will allow for use of new advanced retrofit technologies, which could potentially reduce GHG emissions. However, as stated previously, no regulations have been approved to date by EPA to directly reduce GHG emissions.

The SDCGHGI recognizes that opportunities to reduce emissions from off-road equipment and vehicles are limited. The Inventory estimates that off-road emissions can be reduced by 0.7 MMT CO2E or 4% of the total reduction by 2020.

Environmental commitments to reduce combustion emissions, including GHG emissions, during construction are consistent with current GHG emission reduction strategies relevant to construction and no further reduction strategies are recommended. Reductions in excess of AB 32 goals attributable to transportation-related emissions over the life of the project may also be applied to off-set the project's one-time construction emissions.

Phased Development Emissions Inventory and Comparative Summary – Opening Day Until 2020

This section presents a summary of project-related GHG emissions from opening day until 2020 and provides a comparative summary of GHG emissions over time under a BAU scenario and under proposed project design features. These scenarios do not include emissions associated with construction and VMT. Three scenarios are considered:

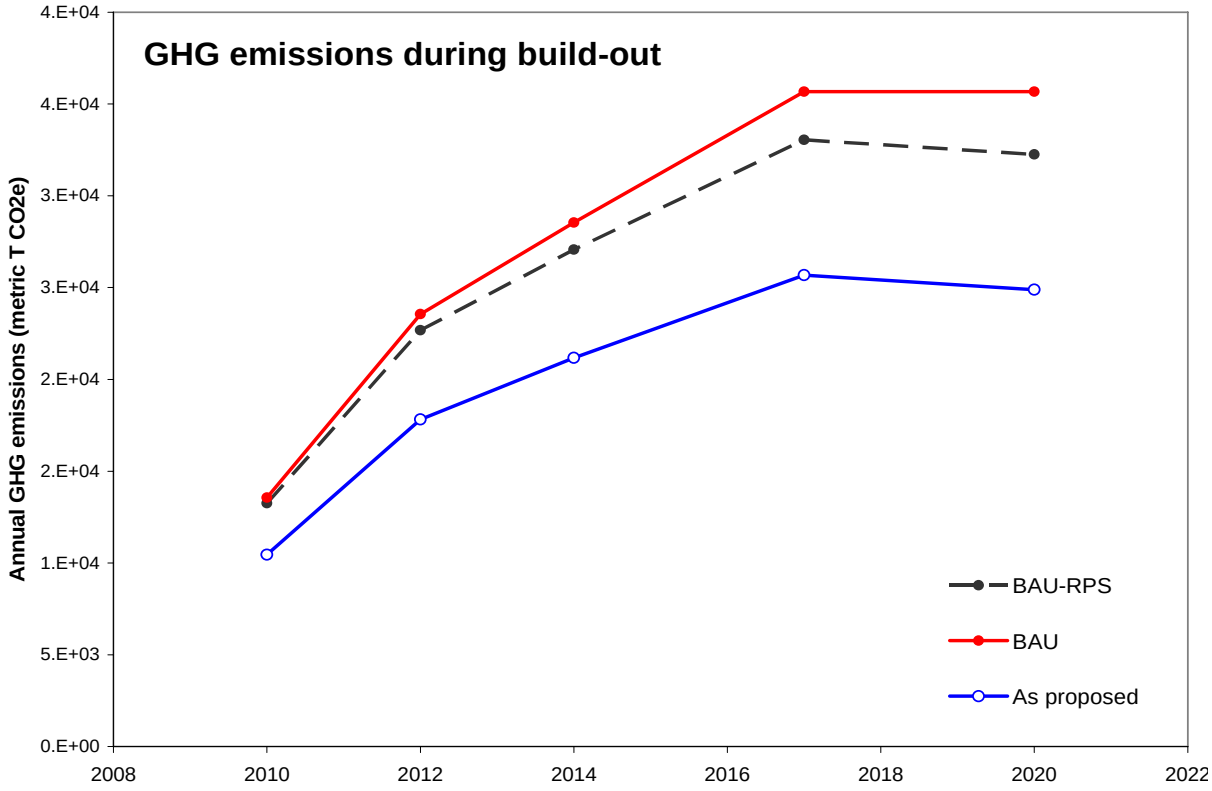
(1) BAU–With Renewable Portfolio Standard (BAU-RPS): The project built to Title 24 requirements without additional energy-saving and GHG-reducing features, but including reductions associated with incremental implementation of the statewide Renewable Portfolio Standard.

(2) BAU–No Renewable Portfolio Standard (BAU): The project built to Title 24 requirements, without additional energy-saving and GHG-reducing features, and without reductions associated with incremental implementation of the statewide Renewable Portfolio Standard.

(3) As Proposed: The project built to Title 24 requirements, including reductions associated with incremental implementation of the statewide Renewable Portfolio Standard and project design features discussed later in this section.

The proposed project design features result in approximately 28% GHG reduction from BAU to the proposed project by build-out in 2017. This increases to over 30% by 2020 with the completion of the phase-in of the statewide Renewable Portfolio Standard. Table 2.1-13 provides GHG emissions estimates for the estimated end of each phase of construction. As noted in the EIR Project Description, the actual date of project completion may vary depending on market conditions.

The graph provided above summarizes the information in Table 2.1-13 and depicts GHG emissions under three scenarios from 2010 (estimated completion of Phase I) through 2017 (estimated build-out) to 2020 (full implementation of the RPS).



In summary, the project incorporates features to reduce GHG emissions consistent with the State of California's GHG reduction goals and strategies for 2020. The project would not interfere with the state's ability to meet GHG reductions goals and strategies for 2020.

2.1.4 Cumulative Impact Analysis

2.1.4.1 Air Quality – Criteria Pollutants

The proposed project is located within the SDAB, which is listed as "non-attainment" for the state AAQS. A project that has a significant impact on air quality with regard to emissions of $PM_{2.5}$, PM_{10}, and ozone precursors (NO_x, and/or VOCs) as determined by the screening criteria outlined above would have a significant cumulative effect. In the event direct impacts from a project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of screening levels, and the project's contribution accounts for more than an insignificant proportion of the cumulative total emissions.

Cumulative Construction Emissions

This section discusses cumulative impacts for particulate matter and other criteria pollutant emissions associated with construction of the Merriam Mountains project potentially in combination with cumulative projects.

PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts because the concentrations would decrease to less than one percent by 100 meters (approximately 330 feet) from the source. Because PM_{10} emissions typically result in near-field impacts, a conservative study area of cumulative projects located within 0.25 mile was reviewed to determine whether PM_{10} emissions could result in cumulatively considerable impact.

Six projects on the cumulative project list are located within 0.25 mile of proposed project construction activities (#'s 28, 29, 31, 47, 48, 69 and 93) (see Figure 1.6-1). These projects include the Discovery Valley Equestrian & Canine Center project (#28), the Walnut Grove Park project (#29), the Pizzuto project (#31), Canyon Villas project (#47), the TERI project (#48), National Quarries (#69) and the Twin Oaks Valley Water Treatment Plan (#93). Project #'s 28, 29 and 48 are located at or below the Sarver curve along flatter stretches of Deer Springs Road and earthmoving is expected to be limited for these projects. In the case of the TERI project (#48), it appears that clearing has already been completed and site work would include finish grading and construction of structures. In the case of the Walnut Grove Park and Discovery Valley Equestrian & Canine Center projects (#'s 28 and 29 respectively), both projects are located several hundred feet south of Deer Springs Road; Walnut Grove Park improvements appear to be completed and Discovery Valley Equestrian & Canine Center includes a new building on an existing finished lot. The Twin Oaks Valley Water Treatment Plant (#93) and Canyon Villas (#47) projects have been constructed. The National Quarries project (#69) includes a reclamation plan and is located adjacent to the northeastern portion of the project site, which is proposed as Biological Open Space.

Potential cumulative air quality impacts for PM_{10} associated with these projects are expected to be minimal due to several factors: a) their location along the flatter portions of Deer Springs Road where less earthwork would be needed; b) some clearing and grading activities appear to already be completed at the TERI and Walnut Grove Park sites; c) remaining work appears to be limited to finish grading and building construction, generally these construction activities generate less PM_{10} than large earthmoving operations; and d) two of the projects have already been constructed (Twin Oaks Valley Water Treatment Plant and Canyon Villas)

The remaining applicable cumulative projects include Pizzuto (#31) and National Quarries (#69). Pizzuto (#31) is located north of the Sarver curve in a steeper area along Deer Springs Road and it is likely that somewhat substantial earthwork would be needed to implement this project. The project would include grading for site access as well as grading for site development. Should the

Pizzuto project be constructed before the proposed project, site access grading would involve widening the existing Deer Springs Place for site access. Should the proposed project be constructed first, Merriam would have completed the Meadow Park Lane access and Meadow Park Lane would provide access for Pizzuto. In no case, would site access for the Pizzuto and Merriam project occur simultaneously. The only earthwork that could occur simultaneously with the proposed project construction activities would be lot grading for Pizzuto. Intervening topography would provide separation between the existing residences that are located between the two project sites; however based on the location of the two projects, a significant impact could result due to the proximity of the project and the fact that some construction activity could occur within 100 meters of each other (Impact AQ-3).

The National Quarries project on Twin Oaks Valley Road would be a source of emissions of fugitive dust and combustion pollutants from on-site equipment and truck traffic. The National Quarries site is located approximately one mile to the east of the Merriam Mountains project site but is within 0.25 miles of the improvements that will be made to Twin Oaks Valley Road as a part of the Merriam Mountains Project. Impacts would generally be localized; however, due to the proximity of the National Quarries site to the Twin Oaks Valley Road improvements and simultaneous operation of the National Quarries facility and construction of the Merriam Mountains Project, the project could result in a cumulatively considerable impact (Impact AQ-3).

Construction emissions from the proposed project would exceed the screening-level thresholds for CO. CO impacts are typically localized and would generally occur at locations where traffic impacts are anticipated rather than where emissions are spread throughout at site such as during construction activities. Because CO impacts are typically localized, and because the operational evaluation demonstrates that no exceedance of the CO standard is anticipated, no cumulatively significant impacts would result from construction activities (refer to the Air Quality Technical Report in Appendix D to this EIR).

Construction emissions for NOx and VOCs would also exceed screening level thresholds. Modeling for individual projects cannot be conducted to evaluate a project's contribution to ozone concentrations due to the complexity of the modeling required and the necessity of modeling the entire air basin to evaluate ozone impacts. Basin-wide modeling is conducted by the APCD as part of its SIP attainment demonstration. The attainment demonstration is a modeling analysis that demonstrates that the SDAB will attain and maintain the ozone standards. The modeling analysis conducted for the attainment demonstration includes construction emissions as part of the analysis. The 2010 emission inventory for the SDAB includes emissions for off-road equipment that are estimated at 15.12 tons per day of ROG, and 34.11 tons per day of NOx. In comparison, the proposed project's maximum daily emissions of ROG are estimated at 0.074 tons per day or 0.5% of the basin-wide total off-road equipment emissions of ROG. The proposed project's maximum daily emissions of NOx are estimated at 0.83 tons per day or 2.4% of the basin-wide total off-road equipment emissions of NOx. Thus the emissions would

constitute a small portion of the overall basin-wide emissions of ozone precursors and would not result in a cumulatively considerable impact.

Cumulative Operational Emissions

With regard to cumulative impacts associated with ozone precursors, in general, provided a project is consistent with the community and general plans, it has been accounted for in the ozone attainment demonstration contained within the SIP and would not cause a cumulatively significant impact on the ambient air quality for ozone because significance levels would not be exceeded. The Merriam Mountains project involves a Specific Plan and a General Plan Amendment and is proposing denser development than accounted for in the current General Plan and therefore in the SIP.

The proposed project is located in the North County East Major Statistical Area, in the Vista Subregional Area. The cumulative projects identified in Tables 1.1-4 and 1.1-5 are located within the Escondido, San Marcos, Vista, and Valley Center Subregional Areas, which are part of the North County East Major Statistical Area. Since the project site is located within the Vista Subregional Area a review of cumulative projects was completed to determine if any projects are proposing densities beyond the General Plan land uses in the Vista Subregional area that would contribute emissions beyond those identified in the SIP. Based on the cumulative projects identified in Tables 1.1-4 and 1.1-5, twenty-five projects are located within the Vista Subregional Area. These projects range in size from 2 dwelling units to 45 dwelling units. None of the projects proposed within the Vista Subregional Area propose General Plan Amendments. Therefore, the cumulative projects have been accounted for in current General Plans and cumulative emissions have been accounted for in SANDAG's growth projections for the Vista Subregional Area.

The cumulative project list includes six projects (#'s 11, 99, 75, 80, 89 and 132) that propose General Plan Amendments, resulting in denser land uses than accounted for in the General Plan. These projects are located within the San Marcos Subregional Area but within the North County East Major Statistical Area. In combination with the Merriam Mountains project, these cumulative projects proposing General Plan Amendments would result in development of 6,726 dwelling units above the 54,251 projected in the North County East Major Statistical Area. This represents 12% of the total number of dwelling units projected in the North County East Major Statistical Area, with the incremental contribution of the proposed project at 4% of the total number of dwelling units within the statistical area. The elimination of industrial uses at the project site that are included in the General Plan would also reduce emissions from industrial activities that would otherwise be emitted under the current General Plan. It is unknown what emission reductions would be achieved from the elimination of industrial uses, but it can be anticipated that emissions from such sources as truck trips, electricity use, and industrial emission sources on site would be eliminated. It is also unknown whether the six cumulative

projects that propose General Plan Amendments will be approved and/or constructed as currently proposed.

The project includes several environmental design considerations that would reduce operational emissions minimizing project impacts. To reduce vehicular emissions and project trip generation, Travel Demand Management measures have been included. Several project features have also been included to reduce energy consumption, which would result in lower operational emissions (see EIR Section 8.0). These features include photovoltaic units, energy performance criteria, LEED certification, cool roof technology, and energy-efficient appliances. Given current and upcoming state mandates and guidelines, it is likely that cumulative projects proposing General Plan Amendments would incorporate similar features.

In summary, as there are no other general plan level projects in the Vista Subregional Area, the Merriam Mountains project would not contribute to an operational cumulative impact in that Subregional Area. The proposed project, combined with all of the cumulative projects in the overall North County East Major Statistical Area, including the general plan level projects in the San Marcos Subregional Area would result in approximately 12% more dwelling units and associated operational emissions than assumed in the SIP for the overall statistical area (see Table 2.1-4). Although, as discussed above for construction emissions, modeling for individual or combined cumulative projects cannot be conducted to evaluate cumulative contributions to ozone contributions, these effects are not considered to be cumulatively considerable for several reasons: 1) features have been incorporated in the project (and likely will be incorporated in all cumulative projects proposing General Plan Amendments) to reduce operational ozone precursor emissions; 2) no cumulative effects would occur within the Vista Subregional Area within which the Merriam project is located and there would be a relatively small cumulative contribution within the North County East Major Statistical Area unlikely to affect the overall basin-wide modeling results completed by the APCD as part of its SIP attainment demonstration; and 3) it is unknown whether projects proposing General Plan Amendments will be approved and/or constructed as currently proposed.

2.1.4.2 Air Quality – Climate Change

California has set goals of returning to 1990 GHG emissions levels by 2020, which, for California and a development project such as Merriam Mountains, means 25% below BAU (Title 24). Project design features incorporated in the project would reduce its contribution to GHG emissions at least 25% below the current standard for housing developments in California. According to the SDCGHGI, the estimated reduction of GHGs is 33% below BAU to achieve the goals identified in AB 32. Project design features and existing regulations are expected to reduce GHG emissions by more than 33% below BAU. When compared to a project that does not adopt such reduction strategies or project design features, the project will contribute to California

meeting its goal of returning to 1990 GHG emissions levels, because the project is on target for meeting the State's goal for 2020.

This does not mean that the County cannot evaluate the significance of the project's contribution to the cumulative problem of climate change and the likelihood that project design features s will reduce GHG emissions from the project in accordance with State goals. In addition to incorporating GHG reduction strategies that meet or exceed the AB 32 statewide goal of 25% and a potential regional goal of 33% below BAU to return to 1990 emission levels by 2020, it is anticipated the project would also comply with any state-mandated requirements resulting from AB 32 and the January 2008 statewide emissions inventory, as well as any County requirements resulting from the GP Update process. Compliance with statewide guidance and mandates would be achieved through implementation of project design features incorporated in the project design (Table 2.1-12). Compliance with statewide guidance and mandates and incorporation of project design features would avoid significant unavoidable effects of the project on climate change, as the project will comply and not interfere with State goals.

2.1.5 Growth-Inducing Impact

As discussed in EIR Section 1.7 and the Growth Inducement Technical Report (Appendix S to the Merriam Mountains Specific Plan Draft EIR, dated August 2007), the proposed project may accelerate the rate in which planned development would occur but is not anticipated to induce unplanned growth. Accelerating the rate in which the planned development is constructed would not cause changes to the SIP or RAQS, as these strategic plans evaluate projects that have been planned for by the jurisdictions. Therefore, air quality impacts would not result from growth induced by the project.

Summary of Air Quality Impacts for Criteria Pollutants

The following air quality impacts have been identified for criteria pollutants resulting from construction emissions:

Numbering for this list of impacts begins with AQ-2. Impact AQ-1 was eliminated in the Final EIR because it was determined that operational emissions for CO and VOCs would not exceed screening level thresholds and impacts would be less than significant.

AQ–2 Emissions associated with construction activities are above the screening level thresholds for criteria pollutants (NO_x, VOCs, PM_{10}, and $PM_{2.5}$).

AQ–3 Simultaneous grading of the proposed project and cumulative projects located in close proximity could result in a cumulatively significant, impact on air quality

2.1.6 Mitigation Measures

Mitigation for Construction Emissions

The following mitigation measures shall be incorporated to reduce direct and cumulative air quality impacts associated with construction:

Numbering for this list of mitigation measures begins with AQ-2. Impact AQ-1 was eliminated in the Final EIR because it was determined that operational emissions for CO and VOCs would not exceed screening level thresholds and impacts would be less than significant.

M–AQ–2a The grading contractor shall provide evidence that 25% of the construction fleet shall use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters, and/or CARB-certified Tier I, II, or III equipment has been utilized during grading phases.

M–AQ–2b The Grading and Improvement Plans shall include specifications that three applications of water during grading between dozer/scraper passes.

M–AQ–2c Paving, chip sealing, or chemical stabilization of internal construction roadways after completion of grading to reduce fugitive dust emissions.

M–AQ–2d The construction relations officer shall require the use of sweepers or water trucks to remove “track-out” at any point of public street access, and termination of grading if winds exceed 25 mph.

M–AQ–2e Stabilization of dirt storage piles by chemical binders, tarps, fencing, or other erosion control.

M–AQ–2f Hydroseeding or the application of bonded fiber matrix on graded residential lots if needed prior to construction to reduce fugitive dust emissions.

M–AQ–2g Grading operations shall be limited to 40 acres per day to ensure construction emissions do not exceed projections completed as part of the air modeling.

M–AQ–2h The Grading and Improvement Plans shall require trucks hauling soil, sand, and other loose materials to be covered, or require trucks to maintain at least 2 feet of freeboard.

M–AQ–2i The Grading and Improvement Plans shall require construction vehicle tires to be inspected and washed so as to be cleaned free of dirt prior to entering public roadways.

M–AQ–2j The Grading and Improvement Plans shall require unpaved exits from the construction site to be graveled to prevent track out to public roadways.

M–AQ–2k The Grading and Improvement Plans shall require construction vehicles to enter the construction site through the graveled roadways, unless an alternative route has been submitted to and approved for use by the County of San Diego.

M–AQ–2l Prior to issuance of grading plans, the project applicant shall: (1) submit contact information for a construction relations officer who will act as a community liaison concerning on-site construction activity, including resolution of issues related to PM_{10} generation; and. (2) install a publicly readable sign with the telephone number of a person to contact regarding dust complaints. The sign shall be placed in conspicuous locations along Deer Springs Road and noted on Grading and Improvement Plans.

M–AQ–2m Grading and Improvement Plans shall designate staging zones on the Merriam property for trucks waiting to load and unload. This zone shall be established in an area where it will not impact adjacent residences.

M–AQ–2n Grading and Improvement Plans shall designate restricted construction equipment areas in the vicinity of sensitive receptors. Construction equipment shall enter these areas only to complete specific construction-related activities and then equipment shall be moved away from the receptors immediately after the activities have been completed.

M–AQ–2o Construction Traffic Control Plans shall be finalized prior to the associated Grading Permits for each phase, which will require construction trucks to be routed away from congested streets or sensitive receptor areas to the extent feasible.

M–AQ–3 Air Quality Mitigation Measures during construction (M-AQ-2a through M-AQ-2o).

Despite implementation of the above measures, which reduce emissions associated with construction activities, the identified construction emission impacts (Impacts AQ-2 and AQ-3) would not be reduced to less than significant with implementation of M-AQ-2a through M-AQ-2o. Therefore, air quality impacts associated with construction would remain significant.

CARB is scheduled to be voting on a regulation requiring owners of off-road, in-use diesel equipment (greater than 25 horsepower) to reduce PM and NO_x emissions. This is an element of the CARB strategy to reach the goal of reducing PM from all diesel-fueled engines in California by 85% by 2020. The regulation would require owners of this equipment to replace, repower, retrofit, or retire their engines at a rate of 8% to10% per year for NO_x reduction through 2020. For PM reductions, owners are required to retrofit 20% of their remaining fleet horsepower with CARB-verified diesel emission control systems (VDECS). These rules call for the complete replacement of three-fourths of the construction fleet. Therefore, the proposed project will include construction equipment, as it becomes readily available, that has been retrofitted and/or replaced and that meets CARB standards.

According to the specifications presented for particulate filters and catalysts from CARB, emissions of NO_x can be reduced from 1.6% to 18%, and emissions of particulate matter can be reduced from 20% to 62.9%. Furthermore, hydrocarbon emissions can be at least 25% lower than any applicable diesel vehicle emission standard. Diesel particulate filters/catalysts are available for certain models of engines and certain model years that can reduce diesel particulate emissions by 25% for Level 1 particulate controls, by 50% for Level 2 particulate controls (which includes alternative fuels), and by 85% for Level 3 particulate controls. However, even with these reductions, use of alternative fuels and/or particulate filters would not reduce construction-generated criteria pollutant emissions to less than of significanct.

M-AQ-2a requires 25% of the construction fleet utilized during construction to use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters, and/or CARB-certified Tier I, II, or III equipment. M-AQ-2a would reduce air quality impacts during construction; however, impacts associated with construction emissions would not be reduced to a level below significance. The 25% requirements was considered a reasonable percentage of the construction fleet based on the amount of contractors whose fleets have already been retrofitted and engines repowered as a result of the local and neighboring Carl Moyer programs.

Additional measures that could further reduce construction emission impacts, though not to a level below significance, include use of aqueous diesel fuel, cooled exhaust recirculation, and use of biodiesel fuels. Use of biodiesel fuels, aqueous diesel fuel, and cooled exhaust recirculation is regarded as infeasible because these fuels and technology are not readily available on the market and would need to be brought separately to the construction site, possibly from distant locations. Haul distances associated with such transport may result in more energy use and an increase in air emissions by up to 60%. The proposed project will utilize CARB-mandated low-sulfur fuels, which are included as an environmental design consideration of the proposed project (see Chapter 8.0). In addition, implementation of these measures, if they were feasible, would not reduce identified impacts to less than significant.

2.1.7 Conclusion

2.1.7.1 Air Quality – Criteria Pollutants

The construction-activity emissions are above the screening-level thresholds for the maximum construction scenario and would therefore pose a significant impact on the ambient air quality during construction. Despite implementation of the mitigation measures listed in EIR Section 2.1.6, which help to reduce emissions associated with construction, the construction impacts (Impact AQ-2) would remain significant for PM_{10}, which would be 7.2 times greater than screening levels and for $PM_{2.5}$, which would be 3.2 times greater than screening levels in absence of mitigation. Even with implementation of all feasible mitigation measures, emissions would exceed applicable standards because the project site is located in an area of non-attainment for PM_{10} and $PM_{2.5}$. Additional mitigation measures were determined infeasible as discussed above because fuels and technology are not readily available on the market and would need to be brought separately to the construction site, possibly from distant locations. Haul distances associated with such transport may result in more energy use and an estimated increase in air emissions by up to 60%.

M-AQ-2a requires 25% of construction equipment to use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters, and/or CARB-certified Tier I, II, or III equipment. M-AQ-2a through M-AQ-2o would reduce construction emissions; however, impacts would not be reduced to less than significant because with implementation of M-AQ-2a through M-AQ-2o, construction emissions would still exceed applicable standards.

The simultaneous operation of the National Quarries facility or the simultaneous construction of any of the cumulative projects within one mile of the Merriam Mountains project during construction would result in a cumulatively significant, impact on air quality (Impact AQ-3). Despite the implementation of M-AQ-3 (M-AQ-2 through M-AQ-2o), which would help reduce emissions associated with construction, cumulative impacts related to construction air emissions would remain significant.

The construction phase of the project is anticipated to require approximately eight years for completion. Project criteria pollutants emissions during construction would constitute a significant impact on the ambient air quality. In addition, it should be noted that construction emissions of CO would only be above the screening-level thresholds during the days when blasting is required. Since the SDAB is currently classified as a nonattainment area under the CAAQS for O_3 and PM_{10}, any construction activity that would exceed the screening-level thresholds in the project area would result in significant and unavoidable air quality impacts.

Operational emissions would be associated with traffic accessing the project site, with area sources such as fireplaces, energy use, and landscaping. Based on the evaluation of air emissions, the project emissions would exceed quantitative emission thresholds for CO. An evaluation of

the potential for CO emissions to cause an exceedance of an air quality standard was conducted. This evaluation showed that project-related traffic would not result in CO hot spots. Furthermore, emissions associated with traffic would decrease with time as older vehicles are phased out and more stringent emission standards are applied to new vehicles. Therefore, impacts are below the County of San Diego's significance thresholds, and the project operational impacts would be less than significant.

2.1.7.2 Air Quality – Climate Change

No project the size of Merriam Mountains is likely to have a direct impact on climate change because the effect would not be perceptible to an observer at any moment or over any duration of time and that perception could not be separated from that of the contributions of other projects in the vicinity, in the region, in the state, or in the country. However, development projects contribute to climate change on a cumulative basis and development projects in the state of California are required to incorporate GHG reduction measures to address the cumulative problem. The project incorporates features that, together with state programs, will reduce GHG emissions more than 33% below BAU. Therefore, the project would not interfere with the State's ability to achieve its GHG reduction goals and strategies set for the year 2020 and would be consistent with the SDCGHGI GHG reduction goals and strategies. The project would not exceed the significance guideline and would not result in a significant cumulative impact.

TABLE 2.1-1a
Ambient Air Quality Standards

Pollutant	Average Time	California Standards		National Standards		
		Concentration	Measurement Method	Primary	Secondary	Measurement Method
Ozone (O_3)	1 hour	0.09 ppm (180 μg/m³)	Ultraviolet photometry	—	—	Ethylene chemiluminescence
	8 hour	0.070 ppm (137 μg/m³)		0.075 ppm (147 μg/m³)	0.075 ppm (147 μg/m³)	
Carbon monoxide (CO)	8 hours	9.0 ppm (10 mg/m³)	Non-dispersive infrared spectroscopy (NDIR)	9 ppm (10 mg/m³)	None	Non-dispersive infrared spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
Nitrogen dioxide (NO_2)[1]	Annual average	0.030 ppm (56 μg/m3	Gas phase chemiluminescence	0.053 ppm (100 μg/m³)	0.053 ppm (100 μg/m³)	Gas phase chemiluminescence
	1 hour	0. 18 ppm (338 g/m3)		—	—	
Sulfur dioxide (SO_2)	Annual average	—	Ultraviolet fluorescence	0.03 ppm (80 μg/m³)	—	Pararosaniline
	24 hours	0.04 ppm (105 μg/m³)		0.14 ppm (365 μg/m³)	—	
	3 hours	—		—	0.5 ppm (1300 μg/m³)	
	1 hour	0.25 ppm (655 μg/m³)		—	—	
Respirable particulate matter (PM_{10})	24 hours	50 μg/m³	Gravimetric or beta attenuation	150 μg/m³	150 μg/m³	Inertial separation and gravimetric analysis
	Annual arithmetic mean	20 μg/m³		50 μg/m³	50 μg/m³	
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	12 μg/m³	Gravimetric or beta attenuation	15 μg/m³	15 μg/m³	Inertial separation and gravimetric analysis
	24 hours	—		355 μg/m³	35 μg/m³	
Sulfates	24 hours	25 μg/m³	Ion chromatography	—	—	—
Lead (Pb)	30-day average	1.5 μg/m³	Atomic absorption	—	—	Atomic absorption
	Calendar quarter	—		1.5 μg/m³	1.5 μg/m³	
Hydrogen sulfide (H_2S)	1 hour	0.03 ppm (42 μg/m³)	Ultraviolet fluorescence	—	—	—
Vinyl chloride	24 hours	0.010 ppm (26 μg/m³)	Gas chromatography	—	—	—

Notes:
ppm= parts per million
μg/m³ = micrograms per cubic meter
mg/m³= milligrams per cubic meter
Source: California Air Resources Board July 2007

[1] On February 22, 2007, the CARB adopted revised NO_2 standards; the 1-hour CAAQS will be 0.18 ppm, and the annual CAAQS will be 0.030 ppm.

TABLE 2.1-1b
Summary of Health Effects of the Major Criteria Pollutants

Air Pollutant	Primary Health Effect
Ozone (O_3)	▪ Aggravation of respiratory and cardiovascular diseases ▪ Impairment of cardiopulmonary function ▪ Eye irritation
Respirable and fine particulates (PM_{10} and PM_{25})	▪ Increased risk of chronic respiratory disease ▪ Reduced lung function ▪ Increased cough and chest discomfort ▪ Particulate matter 10 microns or less in size (PM_{10}) may lodge in and/or irritate the lungs
Carbon monoxide	▪ Impairment of oxygen transport in the bloodstream, increase of carboxyhemoglogin ▪ Aggravation of cardiovascular disease ▪ Impairment of central nervous system function ▪ Fatigue, headache, confusion, dizziness ▪ Death at high levels of exposure ▪ Aggravation of some heart diseases (angina)
Nitrogen dioxide (NO_2)	▪ Risk of acute and chronic respiratory disease
Sulfur dioxide (SO_2)	▪ Aggravation of respiratory diseases (asthma, emphysema) ▪ Reduced lung function ▪ Irritation of eyes

Source: South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993.

TABLE 2.1-1c
Attainment Status of San Diego Air Basin

Air Basin	Ozone		PM_{10}		CO		NO_2		SO_2	
	State	Federal	State	Federal	State	Federal	State	Federal	State	Federal
San Diego	Serious non-attainment	A – 1hr N – 8hr	N	A	A	A	A	A	A	A

Notes:
A = Attains ambient air quality standards
N = Non-attainment
Source: CARB 2003 (http://www.arb.ca.gov/desig/desig.htm) and USEPA 2004 (http://www.epa.gov/region09/air/).

TABLE 2.1-2
Screening-Level Criteria for Air Quality Impacts

Emissions	Total Emissions		
Construction Emissions			
	Lbs. per Day		
Respirable particulate matter (PM_{10})	100		
Fine particulate matter ($PM_{2.5}$)	55		
Oxides of nitrogen (NO_x)	250		
Oxides of sulfur (SO_x)	250		
Carbon monoxide (CO)	550		
Volatile organic compounds (VOC)[1]	75		
Operational Emissions			
	Lbs. per Hour	Lbs. per Day	Tons per Year
Respirable particulate matter (PM_{10})	—	100	15
Fine particulate matter ($PM_{2.5}$)	—	55	10
Oxides of nitrogen (NO_x)	25	250	40
Oxides of sulfur (SO_x)	25	250	40
Carbon monoxide (CO)	100	550	100
Lead and lead compounds	—	3.2	0.6
Volatile organic compounds (VOC)[1]	—	75	13.7
Toxic Air Contaminant Emissions			
Excess cancer risk	10 in 1 million		
Non-cancer hazard	1.0		

Note:
[1]Threshold for VOCs based on the major source threshold for stationary sources in San Diego County of 50 tons per year according to APCD Rule 2(b)(26). The daily threshold is derived by dividing the total tons per year by 365 days. This approach is analogous to the approach used in Chapter 6 of the SCAQMD CEQA Air Quality Handbook (SCAQMD 1993) in developing a significance threshold in lbs/day and tons/year based on the major source threshold in the SCAB.

TABLE 2.1-3
Global Warming Potentials and Atmospheric Lifetimes

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon dioxide	50 – 200	1
Methane	12 ± 3	21
Nitrous oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: tetrafluoromethane (CF_4)	50,000	6,500
PFC: hexafluoroethane (C_2F_6)	10,000	9,200
Sulfur hexafluoride (SF_6)	3,200	23,900

Source: USEPA 2006b.

TABLE 2.1-4

Total Incremental Operational Emissions, lbs/day - 2015

	CO	VOC	NOx	SOx	PM_{10}	$PM_{2.5}$
CURRENT GENERAL PLAN						
Residential Energy Use	1.15E-03	5.87E-06	6.61E-03	—	2.31E-04	2.29E-04
Commercial Energy Use	1.00	4.93E-02	5.73	—	0.199	0.197
Industrial Energy Use	2.89	0.144	16.6	—	0.576	0.570
Landscaping	26.75	3.12	0.35	0.79	0.05	0.05
Vehicular Emissions	869.74	63.38	78.47	1.24	12.11	10.03
TOTAL	900.38	66.69	101.16	2.03	12.94	10.85
GENERAL PLAN AMENDMENT						
Residential Energy Use	8.99E-03	4.59E-04	0.052	—	1.81E-03	1.79E-03
Commercial Energy Use	2.85	1.41	16.40	—	0.568	0.562
Landscaping	26.75	3.12	0.35	0.79	0.05	0.05
Vehicular Emissions	2213.99	161.33	199.75	3.17	30.82	25.54
TOTAL	2243.60	165.86	216.55	3.96	31.44	26.15
Incremental Emissions	*1343.22*	*99.17*	*115.39*	*1.93*	*18.50*	*15.30*
Screening-Level Thresholds	*550*	*75*	*250*	*250*	*100*	*55*
Incremental Emissions Above Screening-Level Thresholds?	*Yes*	*Yes*	*No*	*No*	*No*	*No*

TABLE 2.1-5a
Maximum Daily Estimated Construction Emissions
Grading Operations – All Phases

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Fugitive dust – grading	—	—	—	—	196	41.16
Fugitive dust – trucks on unpaved surfaces	—	—	—	—	33.5	7.04
Fugitive dust – earthmoving	—	—	—	—	36.67	7.70
Fugitive dust – blasting	—	—	—	—	418.71	87.93
Fugitive dust – rock crushing	—	—	—	—	1.386	0.29
Blasting emissions	335	—	85	—	—	—
Rock crusher generator emissions	47.89	3.90	83.73	16.09	3.37	3.34
Heavy equipment exhaust	191.85	62.16	1210.42	176.90	29.85	26.57
Worker travel – vehicle emissions	8.92	0.65	0.74	0.01	0.09	0.07
Construction truck travel – vehicle emissions	3.16	0.65	8.80	0.01	0.39	034
Total	586.82	67.36	1388.69	193.01	719.97	174.44
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*Yes*	*No*	*Yes*	*No*	*Yes*	*Yes*

TABLE 2.1-5b
Maximum Daily Estimated Construction Emissions
Underground Utilities and Street Improvements – All Phases

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Underground Utilities						
Fugitive dust – grading	—	—	—	—	9.8	2.06
Fugitive dust – trucks on unpaved surfaces	—	—	—	—	120.59	25.32
Heavy equipment exhaust	23.35	4.35	77.36	12.08	2.75	2.45
Worker travel – vehicle emissions	3.23	0.24	0.27	0.00	0.03	0.03
Construction truck travel – vehicle emissions	11.36	2.33	31.67	0.40	1.40	1.21
Total	37.94	6.92	109.30	12.12	134.57	31.07
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*No*	*No*	*No*	*No*	*Yes*	*No*
Street Improvements						
Fugitive dust – grading	—	—	—	—	9.8	2.06
Fugitive dust – trucks on unpaved surfaces	—	—	—	—	120.59	25.32
Heavy equipment exhaust	26.22	4.79	91.06	14.40	2.90	2.58
Worker travel – vehicle emissions	6.31	0.46	0.53	0.01	0.06	0.06
Construction truck travel – vehicle emissions	11.36	2.33	31.67	0.04	1.40	1.21
Asphalt offgassing	—	5.24	—	—	—	—
Total	43.89	12.82	123.26	14.45	134.75	31.22
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*No*	*No*	*No*	*No*	*Yes*	*No*
Landscaping						
Heavy equipment exhaust	9.15	1.97	32.39	4.86	1.24	1.10
Worker travel – vehicle emissions	2.31	0.17	0.19	0.00	0.02	0.02
Total	11.46	2.14	32.58	4.86	1.26	1.12
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

TABLE 2.1-5c
Maximum Daily Estimated Construction Emissions
House Construction – All Phases

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Heavy equipment exhaust	13.30	2.27	29.70	4.68	1.68	1.50
Worker travel – vehicle emissions	49.22	3.58	4.10	0.06	0.47	0.39
Construction truck travel – vehicle emissions	6.31	1.30	17.60	0.02	0.78	0.67
Architectural coatings	—	35.98	—	—	—	—
Total	68.83	43.13	51.40	4.76	2.93	2.56
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

TABLE 2.1-5d
Maximum Daily Estimated Construction Emissions
Commercial Building Construction

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Heavy equipment exhaust	14.65	2.74	38.90	6.02	1.90	1.69
Worker travel – vehicle emissions	14.15	1.03	1.18	0.02	0.14	0.11
Construction truck travel – vehicle emissions	3.16	0.65	8.80	0.01	0.39	0.34
Architectural coatings	—	21.32	—	—	—	—
Total	31.96	25.74	48.88	6.05	2.43	2.14
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

TABLE 2.1-5e
Maximum Daily Estimated Construction Emissions
Recreational Facilities Construction

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Fugitive dust – grading	—	—	—	—	9.8	20.6
Fugitive dust – trucks on unpaved surfaces	—	—	—	—	33.50	7.04
Heavy equipment exhaust	27.38	3.36	47.36	8.29	2.78	2.47
Worker travel – vehicle emissions	5.38	0.39	0.45	0.01	0.05	0.04
Construction truck travel – vehicle emissions	3.16	0.65	8.80	0.01	0.39	0.34
Total	35.92	4.40	56.61	8.31	46.52	30.49
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

TABLE 2.1-5f
Maximum Construction Emissions

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
underground utilities	37.94	6.92	109.30	12.12	134.57	31.07
site grading	586.82	67.36	1,388.89	193.01	391.57	105.48
House construction	68.83	43.13	51.40	4.76	2.93	2.56
Commercial building construction	31.96	25.74	48.88	6.05	2.43	2.14
Recreational facilities	35.92	4.40	56.61	8.31	46.52	30.49
Total	761.47	147.55	1,654.88	224.25	578.02	171.74
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*

TABLE 2.1-6
Total Operational Emissions 2015

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Residential energy use	8.99E-03	4.59E-04	0.052	—	1.81E-03	1.79E-03
Commercial energy use	2.85	1.41	16.40	—	0.568	0.562
Landscaping	26.75	3.12	0.35	0.79	0.05	0.05
Vehicular emissions	2213.99	161.33	199.75	3.17	30.82	25.54
Total	2243.60	165.86	216.55	3.96	31.44	26.15
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*Yes*	*Yes*	*No*	*No*	*No*	*No*
Tons/year						
Residential energy use	1.64E-03	8.38E-05	9.44E-03	—	3.30E-04	3.30E-04
Commercial energy use	0.52	0.0257	2.99	—	0.104	0.103
Landscaping	2.41	0.28	0.03	0.07	0.00	0.00
Vehicular emissions	404.05	29.44	36.45	0.58	5.62	4.66
Total	406.98	29.75	39.48	0.65	5.72	4.76
Screening-level thresholds	100	13.7	40	100	15	10
Above screening-level thresholds?	*Yes*	*Yes*	*No*[1]	*No*	*No*	*No*
Significant Impact	*No* [2]	*No* [2]	*No*	*No*	*No*	*No*

Notes:

[1] NOx emissions are below the screening level thresholds in 2015 in comparison to the air modeling completed in the August 2007 DEIR as a result of the EMFAC2007 model results. The August 2007 DEIR utilized EMFAC2002 model, which resulted in increased NOx emissions in comparison to the EMFAC2007 model.

[2] See Table 2.1-6. Long-term emissions would be below the screening-level thresholds for all pollutants by 2040, with the exception of CO. Since CO emissions were above the screening-level thresholds in 2015 and 2040, a CO Hot Spot Analysis was completed to determine whether CO emissions would cause a ground-level exceedance of the NAAQS or CAAQS. The predicted CO concentrations would not result in a CO Hot Spot.

TABLE 2.1-7
Total Operational Emissions 2040

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Residential energy use	8.99E-03	4.59E-04	0.052	—	1.81E-03	1.79E-03
Commercial energy use	2.85	1.41	16.40	—	0.568	0.562
Landscaping	26.75	3.12	0.35	0.79	0.05	0.05
Vehicular emissions	852.89	63.10	79.25	3.17	30.61	25.33
Total	882.50	67.63	96.05	3.96	31.23	25.94
Screening-level thresholds	550	75	250	250	100	55
Above screening-level thresholds?	*Yes*	*No*	*No*	*No*	*No*	*No*
Tons/year						
Residential energy use	1.64E-03	8.38E-05	9.44E-03	—	3.30E-04	3.30E-04
Commercial energy use	0.52	0.0257	2.99	—	0.104	0.103
Landscaping	2.41	0.28	0.03	0.07	0.00	0.00
Vehicular emissions	155.65	11.52	14.46	0.58	5.59	4.62
Total	158.58	11.83	17.49	0.65	5.69	4.72
Screening-level thresholds	100	13.7	40	100	15	10
Above screening-level thresholds?	*Yes*	*No*	*No*	*No*	*No*	*No*
Significant Impact	*No*[1]	*No*	*No*	*No*	*No*	*No*

Notes:
[1] Since CO emissions were above the screening-level thresholds in 2015 and 2040, a CO Hot Spot Analysis was completed to determine whether CO emissions would cause a ground-level exceedance of the NAAQS or CAAQS. The predicted CO concentrations would not result in a CO Hot Spot.

TABLE 2.1-8
Current State Requirements for GHG Emissions Associated with Transportation

Strategy to Reduce GHG Emissions	Current State Requirements
Vehicle climate change standards and other light-duty vehicle technology	This measure applies to motor vehicles. CARB is required by AB 1493 to adopt regulations that achieve the maximum feasible, cost-effective, and technologically achievable reductions of GHG pollution emitted by new passenger vehicles. Implementation of AB 1493 would reduce fleet-wide vehicle GHG emissions by 20% in 2020.
Low-carbon fuels standard	This measure applies to motor vehicle fuels. By 2020, motor fuels sold in California will have 10% low carbon intensity when compared to equivalent fuel sold in 2007. This standard will reduce GHG emissions from vehicles (and other gasoline-powered engines) associated with Merriam Mountains.
Telework	All residential units will have access to high-speed Internet connections suitable for telecommuting (California Environmental Protection Agency 2007, CARB Early Action Measure 2-21).

TABLE 2.1-9
GHG Emissions – Construction Heavy Equipment

Equipment – Fuel	HP	Load Factor	CO_2	No. of Equip	Hrs per Day	Days in Service	CO_2
Backhoe	77	43	1.252893582	2	8	250	663.73
Motor grader	156.6	74	1.252893582	2	8	250	2,323.05
Forklifts	93	47.5	1.252893582	4	8	250	1,771.09
Aerial lifts	43	50.5	1.252893582	2	8	250	435.31
Total							5,193.17

TABLE 2.1-10
GHG Emissions – Construction Worker Estimates and Emission Calculations

Construction Phase	Vehicle Class	No. of Workers per Construction Phase	Speed (mph)	VMT (mi/ vehicle-day)	CO_2		CO_2, lbs/day	Days	CO_2, Tons
					Running Exhaust (g/mi)	Start-Up (g/start)a			
Grading – all phases	Light-duty truck, catalyst	58	35	20	384.358	207.006	1035.89	1122	581
Phase 1 underground utilities	Light-duty truck, catalyst	21	35	20	384.358	207.006	375.06	265	50
Phase 1 street improvements	Light-duty truck, catalyst	41	35	20	384.358	207.006	732.26	70	26
Phase 1 landscaping	Light-duty truck, catalyst	15	35	20	384.358	207.006	267.90	100	13
Phase 2 underground utilities	Light-duty truck, catalyst	21	35	20	384.358	207.006	375.06	240	45
Phase 2 street improvements	Light-duty truck, catalyst	41	35	20	384.358	207.006	732.26	60	22
Phase 2 landscaping	Light-duty truck, catalyst	15	35	20	384.358	207.006	267.90	90	12
Phase 3 underground utilities	Light-duty truck, catalyst	21	35	20	384.358	207.006	375.06	165	31
Phase 3 street improvements	Light-duty truck, catalyst	41	35	20	384.358	207.006	732.26	50	18
Phase 3 landscaping	Light-duty truck, catalyst	15	35	20	384.358	207.006	267.90	60	8
House Construction (each phase)	Light-duty truck, catalyst	320	35	20	384.358	207.006	5715.24	500	1429
Commercial buildings	Light-duty truck, catalyst	92	35	20	384.358	207.006	1643.13	250	205
Recreational facilities	Light-duty truck, catalyst	35	35	20	384.358	207.006	625.10	250	78
TOTAL CO_2 Emissions							6.57		2519

Notes:
Distances calculated using www.mapquest.com: Construction crew from Escondido/San Marcos (<5 miles one way)
Assume startup after 8 hours
Assume 45 minutes run time total
2006 Emission Factors from EMFAC 2002, average temp 55°F

Construction Worker Estimates and Emission Calculations:
Per Table A9-17, SCAQMD CEQA Air Quality Handbook, the number of construction workers is estimated by E = F×G×H/1E6 ×I or G×H/1E6 × I where F, G, H, I in Tables A9-17A through A9-17C.

Construction Phase	E	F	G	H
House Construction	320.1971091	55.7	1,594,000	9.2
Commercial Buildings	91.50987552	45.15	562,000	9.2
Recreational Facilities	35.47537928		8,822,000	8.78
Landscaping	15			

TABLE 2.1-11a
Summary of Greenhouse Gas Emissions Inventory

Category	Source	2007 T CO_2e/year	Cumulative GHG Reduction	Percentage GHG Reduction
Direct emissions	Natural gas (Scope 1)	9,580		
Indirect emissions	Purchased electricity (Scope 2)	24,924		
	Embodied energy of water (Scope 3)	2,358		
Transportation	ADT method (Scope 3)	29,865		
Total †	Direct + indirect (not including transportation)	36,862		
	Renewable Portfolio Standard	33,436[1]	3,426[2]	9.3%[3]
	Energy efficiency improvements (25% better than Title 24 standards)	26,592[4]	10,270[2]	27.9%[3]
	Water conservation measures (50% reduction)	25,413[5]	11,449	31.1%
	Photovoltaic installations (20% of suitable DUs)	24,866[6]	11,951[2]	32.4%[3]

Notes:
Backup calculations for transportation, water use, and commercial and residential emissions under the 2007 year and with application of GHG reduction strategies are included in Appendix Y to this EIR.

[1] GHG emissions for the proposed project at build-out assume full implementation of the California Renewal Portfolio Standard (33% renewable electric power by 2020). The baseline estimates († ‡) assume Title-24 compliant buildings. Emissions within operational control (‡) include: direct combustion emissions (natural gas), purchased electricity, and embodied energy in water. Reductions from these baselines reflect full implementation of the state-mandated Renewable Portfolio Standard (RPS), high-performance energy efficiency measures, water conservation measures, and photovoltaic installations on 20% of suitable dwelling units.

[2] Cumulative GHG reductions compare the total GHG emissions in the goal year (2020) to those under BAU conditions. The cumulative GHG Reduction is the total GHG emissions reduction from BAU. Reductions accumulate with each successive measure (the bottom line reflects the total reduction).

[3] Percent reduction of GHG emissions from BAU. Percentage reductions accumulate with each successive measure (the bottom line reflects the total reduction).

[4] Energy efficiency improvements that would be included for the proposed project that would be 25% better than existing Title 24 standards (25% reduction in energy use and 32% reduction in natural gas use).

[5] The proposed project will implement water conservation measures to achieve a 50% reduction in embodied energy in water from BAU consumption.

[6] Total GHG emissions for the proposed project at build out (bottom line) assume full implementation of the California Renewable Portfolio Standards, energy efficiency improvements 25% better than existing Title 24 standards, water conservation measures, and photovoltaic installations on 20% of suitable dwelling units.

TABLE 2.1.11b
Summary of Greenhouse Gas Emissions Inventory

Emissions Sources and Reductions		Metric Tons CO2e per Year	
Non-Transportation Emissions			
Business as Usual			
Direct Emissions (CTG)		9,580	
Indirect Emissions (CTG)		—	
Purchased Electricity		24,924	
Embodied Energy of Water		2,358	
Total Non-Transportation Emissions		36,862	
Reductions due to PDFs and RPS (Renewable Portfolio Standard)			
Renewable Portfolio Standard (9.3% reduction)		3,426	
Energy Efficiency Improvements (25% above Title 24)		6,844	
Water Conservation (50% reduction in the embodied energy of water)		1,179	
Photovoltaic Installations (20% of Suitable Dwelling Units)		502	
Total Reductions		11,951	
Net Non-Transportation Emissions		24,866	32.4%
Transportation Emissions			
Business as Usual			
Transportation Emissions		29,865	
Reductions due to Statewide Measures			
	Percent Reduction		
Pavley Motor Vehicle Standards	18%	5,376	
Improved Vehicle Efficiency/Hybrids (CARB)	3%	896	
Low Carbon Fuel Standard (SDCGHGI)	10%	2,359	
Total Reductions		8,631	
Net Transportation Emissions		21,234	31%

Notes: Backup calculations for transportation, water use, and commercial and residential emissions under the 2007 year and with application of GHG reduction strategies are included in Appendix Y to this EIR. GHG emissions for the proposed project at build-out assume full implementation of the California Renewal Portfolio Standard (33% renewable electric power by 2020). The baseline estimates assume Title-24 compliant buildings. Emissions within operational control include: direct combustion emissions (natural gas), purchased electricity, and embodied energy in water. Reductions from these baselines reflect full implementation of the state-mandated Renewable Portfolio Standard (RPS), high-performance energy efficiency measures, water conservation measures, and photovoltaic installations on 20% of suitable dwelling units.

TABLE 2.1-12
Merriam Mountain Proposed Project Design Features to Reduce GHG Emissions

Strategy to Reduce GHG Emissions	Proposed Project Design Features
Achieve 50% statewide diversion goal	Merriam Mountains will provide commercial tenants and residents with separate recycling and waste receptacles to support the 50% statewide solid waste diversion goal (California Assembly Bill No. 939). Merriam Mountains will require separation and recycling of construction waste.
Forestry	The Merriam Mountains landscaping palette will include drought-tolerant trees. These plantings will contribute to on-site carbon storage, provide shade, and reduce heating from impervious surfaces (California Environmental Protection Agency 2007, CARB Early Action Measure/Energy Efficiency 2-9).
Afforestation/reforestation	Merriam Mountains' compact land-use patterns reduce habitat fragmentation and contribute to the preservation of natural habitats, including forests and woodlands.
Water use efficiency	Merriam Mountains will strive for a 50% reduction in embodied energy in water use through features such as low-flow appliances (including toilets, shower heads, and washing machines), a drought-tolerant landscape palette, weather-based irrigation controllers, and other water conservation measures. The 50% reduction in embodied energy in water generally equates to the following water savings: 20% to 40% of domestic water use through low-flow fixtures and faucets and 25% to 50% of domestic water use through drought-tolerant landscaping and weather-based controllers
Building energy efficiency	Commercial buildings at Merriam Mountains will achieve energy performance equivalent to 25% better than current Title 24 standards.
Appliance energy efficiency	Builders will be offer residents their choice of energy-efficient appliances (including washer/dryers and refrigerators), and appliances installed by builders will be Energy Star (including dishwashers) or equivalent.
Smart land use and intelligent transportation systems	Merriam Mountains' central location with respect to major employment centers and transportation corridors is intended to create the opportunity for residents to shorten their commutes and reduce aggregate vehicle miles traveled (assuming the proposed project would reduce trips from Riverside County to San Diego County).
Green buildings initiative	All residential builders at Merriam Mountains will participate in the California Green Builder Program through the home builder submitting a completed CGDB application to the CGB program coordinator. The CGB program coordinator will review the submitted application and verifies compliance with the CGB requirements. Upon application approval the project will be scheduled for a CGB certified inspector to ensure the project has met the CGB requirements. Per the inspections completed the CGB will provide certification that the structures have met the requirements.. Residences will achieve energy performance equivalent to 25% better than current Title 24 standards. All commercial structures will achieve, at a minimum, a Silver certification under the U.S. Green Building Council's LEED for Core and Shell (LEED-CS) program. The project will be required to submit a scorecard to become registered as a LEED-CS, which is a formal recognition by the USGBC given to a project. The USGBC will provide a letter that details the terms and conditions for LEED-CS certification. Where feasible, commercial structures will use cool roof technologies and light-colored paving (California Environmental Protection Agency 2007, CARB Early Action Measure/Energy Efficiency 2-9).
Hydro fluorocarbon reduction	Consumer products installed in residences and systems used by tenants in commercial space will comply with CARB's Early Action Guidance regarding the reduction of GHG emissions. This includes consistency with CARB guidance for commercial refrigeration systems (California Environmental Protection Agency 2007, Early Action Measure 2-3).
California solar initiative	Merriam Mountains will provide photovoltaic units for 20% of suitable single-family dwelling units.

TABLE 2.1-12
Merriam Mountain Proposed Project Design Features to Reduce GHG Emissions

Strategy to Reduce GHG Emissions	Proposed Project Design Features
Education	Merriam Mountains will provide educational materials for residents and commercial tenants discussing strategies for reducing GHG emissions associated with the operation of their buildings (California Environmental Protection Agency 2007, CARB Early Action Measure/Education 2-7).
Mixed Use Development	Merriam Mountains has been designed as a mixed use development, incorporating a mix of multifamily housing types, single family housing, and commercial uses. This design approach helps reduce trips and vehicle miles traveled by providing residents with retail choices close to their homes.
Bicycle and pedestrian-friendly environment	Merriam Mountains will provide bicycle and pedestrian facilities, including sidewalks through the project, bicycle lanes, multi-use trails, and regional bicycle facilities to encourage residents to use alternative modes of transportation.
Rideshare/Carpool/Vanpool promotion	Merriam Mountains will promote and support ridesharing/carpooling/vanpooling through the creation of an online ridesharing program that matches potential carpoolers immediately through email.
Street segment and intersection improvements	Merriam Mountains will improve existing street segments and intersections in the project vicinity, increasing miles per gallon by allowing for more efficient vehicle speeds on major roadways.

Note:
Additional measures for reducing project generated ADT are provided in Chapter 8 - Travel Demand Management measures

TABLE 2.1-13
Greenhouse Gas Emissions at the End of Each Construction Phase (metric tons CO_2e per year)

	Phase I	Phase II	Phase III	Phase IV	
	2010	2012	2014	2017	2020
BAU	13,560	23,551	28,547	35,684	35,684
BAU-RPS	13,259	22,681	27,071	33,048	32,257
As proposed	10,458	17,817	21,174	25,677	24,886

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