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GREENHOUSE GAS ANALYSIS
ROSEMARY MOUNTAIN MUP UPDATE
COUNTY OF SAN DIEGO, CALIFORNIA

PDS2013-MUP87-021W2, PDS2013-RC-87-001W2
Log No: 87-2-13

February 27, 2012

JN:07645-07 GHG REPORT
HQ

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ROSEMARY MOUNTAIN QUARRY MUP UPDATE
GREENHOUSE GAS ANALYSIS
COUNTY OF SAN DIEGO, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of the greenhouse gas analysis (GHGA) conducted by Urban Crossroads, Inc., for the Rosemary Mountain Quarry MUP Update (Project). The Project site is generally located east of I-15 and adjacent to the SR-76 in the County of San Diego.

The purpose of this GHGA is to evaluate Project-related emissions and determine the level of greenhouse gas (GHG) impacts as a result of the Project.

The guideline that is being used to determine the significance of impacts is whether or not the project will exceed 10,000 metric tons of carbon dioxide (CO2) (or equivalent)[1]. The purpose of this Guideline is to demonstrate that the proposed project will not conflict with implementation of the California Global Warming Solutions Act of 2006 (Assembly Bill 32, AB32).

1.1 PROJECT OVERVIEW

It should be noted that an Environmental Impact Report (EIR) was prepared and adopted for the Rosemary Mountain Quarry project in 1996. At that time no methods or thresholds relating to GHG were established and therefore the 1996 EIR did not address GHG impacts.

It is our understanding that the proposed Rosemary Mountain Quarry Major Use Permit (MUP) update would consist of extending the quarry's hours of operation on weekdays and Saturdays (it should be noted that although the hours of operation are being extended, no additional trips or activity are expected on a daily bases, rather operations would be spread out over the course of the day when comparing to what was included in the 1996 EIR).

The MUP update also includes the use of traditional heavy-duty construction equipment in lieu of an electric shovel and conveyor during project operations. The previously adopted EIR assumed an electric shovel and conveyor would be operational, a modification to the MUP is being requested to allow for the

[1] San Diego County Industrial Use / East Otay Mesa Specific Plan DPLU Interim Guidance for Greenhouse Gas (GHG) Analysis – May 7, 2010

use of traditional heavy-duty construction equipment. All other activities related to the Project in the previous EIR would remain unchanged.

1.2 SUMMARY OF FINDINGS

As previously noted since the 1996 EIR did not evaluate GHG impacts, this report quantifies GHG emissions as they would occur based on the assumptions in the 1996 EIR. Emissions are then compared to the applicable 10,000 metric ton CO2 (or equivalent) threshold.

Based on the 1996 EIR assumptions, the Project would result in 6,051.64 metric tons CO2 (or equivalent) which is less than the 10,000 metric ton CO2 (or equivalent) threshold and a less than significant impact would occur.

Similarly, emissions for the Project with the MUP update were calculated. Emissions are then compared to the applicable 10,000 metric ton CO2 (or equivalent) threshold.

Based on the proposed MUP Update, the Project would result in 7,963.27 metric tons CO2 (or equivalent) which is less than the 10,000 metric ton CO2 (or equivalent) threshold and a less than significant impact would occur.

2.0 BACKGROUND

2.1 INTRODUCTION TO GLOBAL CLIMATE CHANGE

Global Climate Change (GCC) is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. GCC is currently one of the most controversial environmental issues in the United States, and much debate exists within the scientific community about whether or not GCC is occurring naturally or as a result of human activity. Some data suggests that GCC has occurred in the past over the course of thousands or millions of years. These historical changes to the Earth's climate have occurred naturally without human influence, as in the case of an ice age. However, many scientists believe that the climate shift taking place since the industrial revolution (1900) is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of greenhouse gases in the earth's atmosphere, including carbon dioxide, methane, nitrous oxide, and fluorinated gases. Many scientists believe that this increased rate of climate change is the result of greenhouse gases resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed Project evaluated in this GHGA cannot generate enough greenhouse gas emissions to effect a discernible change in global climate. However, the proposed Project may participate in the potential for GCC by its incremental contribution of greenhouse gasses combined with the cumulative increase of all other sources of greenhouse gases, which when taken together constitute potential influences on GCC. Because these changes may have serious environmental consequences, Section 3.0 will evaluate the potential for the proposed Project to have a significant effect upon the environment as a result of its potential contribution to the greenhouse effect.

2.2 GREENHOUSE GAS EMISSIONS INVENTORIES

Global

Worldwide anthropogenic (man-made) GHG emissions are tracked by the Intergovernmental Panel on Climate Change for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Man-made GHG emissions data for Annex I nations are available through 2009. Man-made GHG emissions data for Non-Annex I nations are available through 2007. For the Year 2009 the

sum of these emissions totaled approximately 40,084 MMTCO2e.[2] Emissions from the top five countries and the European Union accounted for approximately 65 percent of the total global GHG emissions, according to the most recently available data (see Table 2-1, Top GHG Producer Countries and the European Union). The GHG emissions in more recent years may differ from the inventories presented in Table 2-1; however, the data is representative of currently available inventory data.

United States

As noted in Table 2-1, the United States was the number two producer of GHG emissions in 2009. The primary greenhouse gas emitted by human activities in the United States was CO2, representing approximately 83 percent of total greenhouse gas emissions.[3] Carbon dioxide from fossil fuel combustion, the largest source of US greenhouse gas emissions, accounted for approximately 78 percent of the GHG emissions.[4]

TABLE 2-1

TOP GHG PRODUCER COUNTRIES AND THE EUROPEAN UNION[5]

Emitting Countries	GHG Emissions (MMT CO2e)
China	6,703
United States	6,608
European Union	8,338
Russian Federation	2,159
India	1,410
Japan	1,209
Total	**26,427**

State of California

CARB compiles GHG inventories for the State of California. Based upon the 2008 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2008 greenhouse gas emissions

[2] The global emissions are the sum of Annex I and non-Annex I countries, without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries without 2005 data, the UNFCCC data for the most recent year were used. United Nations Framework Convention on Climate Change, "Annex I Parties – GHG total without LULUCF," http://unfccc.int/ghg_emissions_data/ghg_data_from_unfccc/time_series_annex_i/items/3841.php and "Flexible GHG Data Queries" with selections for total GHG emissions excluding LULUCF/LUCF, all years, and non-Annex I countries, http://unfccc.int/di/FlexibleQueries/Event.do?event= showProjection. n.d.

[3] US Environmental Protection Agency, "Inventory of US Greenhouse Gas Emissions and Sinks 1990–2009," http://www.epa.gov/climatechange/emissions/usgginventory.html. 2011.

[4] *ibid*

[5] World Resources Institute, " Climate Analysis Indicator Tool (CAIT) Excludes emissions and removals from land use, land-use change and forestry (LULUCF) Emissions Inventory," http://cait.wri.org

inventory, California emitted 474 MMTCO2e ***including*** emissions resulting from imported electrical power in 2008.[6] Based on the CARB inventory data and GHG inventories compiled by the World Resources Institute[7], California's total statewide GHG emissions rank second in the United States (Texas is number one) with emissions of 417 MMTCO2e ***excluding*** emissions related to imported power.

2.3 GLOBAL CLIMATE CHANGE DEFINED

Global Climate Change (GCC) refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water vapor, CO_2 (Carbon Dioxide), N_2O (Nitrous Oxide), CH_4 (Methane), hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. These particular gases are important due to their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the Earth's atmosphere, but prevent radioactive heat from escaping, thus warming the Earth's atmosphere. GCC can occur naturally as it has in the past with the previous ice ages. According to the California Air Resources Board (CARB), the climate change since the industrial revolution differs from previous climate changes in both rate and magnitude (CARB, 2004, Technical Support document for Staff Proposal Regarding Reduction of Greenhouse Gas Emissions from Motor Vehicles).

Gases that trap heat in the atmosphere are often referred to as greenhouse gases. Greenhouse gases are released into the atmosphere by both natural and anthropogenic (human) activity. Without the natural greenhouse gas effect, the Earth's average temperature would be approximately 61° Fahrenheit (F) cooler than it is currently. The cumulative accumulation of these gases in the earth's atmosphere is considered to be the cause for the observed increase in the earth's temperature.

Although California's rate of growth of greenhouse gas emissions is slowing, the state is still a substantial contributor to the U.S. emissions inventory total. In 2004, California is estimated to have produced 492 million gross metric tons of carbon dioxide equivalent (CO2e) greenhouse gas emissions. Despite a population increase of 16 percent between 1990 and 2004, California has

[6] California Air Resources Board, "California Greenhouse Gas 2000-2008 Inventory by Scoping Plan Category - Summary," http://www.arb.ca.gov/cc/inventory/data/data.htm. 2010.
[7] World Resources Institute, " Climate Analysis Indicator Tool (CAIT)-US – Yearly Emissions Inventory," http://cait.wri.org

significantly slowed the rate of growth of greenhouse gas emissions due to the implementation of energy efficiency programs as well as adoption of strict emission controls.[8]

2.4 GREENHOUSE GASES

For the purposes of this analysis, emissions of carbon dioxide, methane, and nitrous oxide were evaluated (see Table 3-4 later in this report) because these gasses are the primary contributors to GCC from development projects. Although other substances such as fluorinated gases also contribute to GCC, sources of fluorinated gases are not well defined and no accepted emissions factors or methodology exist to accurately calculate these gases.

Greenhouse gases have varying global warming potential (GWP) values; GWP values represent the potential of a gas to trap heat in the atmosphere. Carbon dioxide is utilized as the reference gas for GWP, and thus has a GWP of 1.

The atmospheric lifetime and GWP of selected greenhouse gases are summarized in the following Table. As shown in the table below, GWP range from 1 for carbon dioxide to 23,900 for sulfur hexafluoride.

TABLE 2-2
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIME OF SELECT GHGS

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 (CH4)	50,000	6,500
PFC: Hexafluoroethane (C2F6)	10,000	9,200
Sulfur Hexafluoride (SF6)	3,200	23,900
Source: EPA 2006 (URL: http://www.epa.gov/nonco2/econ-inv/table.html)		

[8] California Energy Commission, "Inventory of California Greenhouse Gas Emissions and Sinks," http://www.energy.ca.gov/2005publications/CEC-600-2005-025/CEC-600-2005-025.PDF. 2005.

Water Vapor: Water vapor (H_20) is the most abundant, important, and variable greenhouse gas in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. A climate feedback is an indirect, or secondary, change, either positive or negative, that occurs within the climate system in response to a forcing mechanism. The feedback loop in which water is involved is critically important to projecting future climate change.

As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up).

There are no human health effects from water vapor itself; however, when some pollutants come in contact with water vapor, they can dissolve and the water vapor can then act as a pollutant-carrying agent. The main source of water vapor is evaporation from the oceans (approximately 85 percent).[9] Other sources include: evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.

Carbon Dioxide: Carbon dioxide (CO_2) is an odorless and colorless GHG. Outdoor levels of carbon dioxide are not high enough to result in negative health effects. Carbon dioxide is emitted from natural and manmade sources. Natural sources include: the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include: the burning of coal, oil, natural gas, and wood. Carbon dioxide is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks[10].

[9] ibid.
[10] On awarmer Earth, chemical weathering is promoted by more vigorous cycling of water through the atmosphere and higher temperatures.

Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO_2 concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30 percent. Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources.[11]

Methane: Methane (CH_4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs. No health effects are known to occur from exposure to methane.

Methane has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning. [12]

Nitrous Oxide: Nitrous oxide (N_2O), also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage)[13].

Concentrations of nitrous oxide also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb).[14] Nitrous oxide is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is

"More chemical weathering removes more CO2 from the atmosphere as carbonic acid reacts with silicate minerals, producing bicarbonate ion." *Carbon Cycle and Climate Change* – J Bret Bennington, Hofstra University. http://www.cengage.com/custom/enrichment_modules/data/Carbon_Cycle_0495738557_LowRes.pdf

[11] International Panel on Climate Change 2007, "Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report," http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm

[12] ibid.

[13] U.S. Department of Labor. Occupational Safety and Health Guideline for Nitrous Oxide. http://www.osha.gov/SLTC/healthguidelines/nitrousoxide/recognition.html

[14] ibid.

used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. Nitrous oxide can be transported into the stratosphere, be deposited on the Earth's surface, and be converted to other compounds by chemical reaction

Chlorofluorocarbons: Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the Earth's surface). CFCs are no longer being used; therefore, it is not likely that health effects would be experienced. Nonetheless, in confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation.

CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining steady or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

Hydrofluorocarbons: Hydrofluorocarbons (HFCs) are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the greenhouse gases, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2). Prior to 1990, the only significant emissions were of HFC-23. HFC-134a emissions are increasing due to its use as a refrigerant. The U.S. EPA estimates that concentrations of HFC-23 and HFC-134a are now about 10 parts per trillion (ppt) each; and that concentrations of HFC-152a are about 1 ppt.[15] No health effects are known to result from exposure to HFCs, which are manmade for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons: Perfluorocarbons (PFCs) have stable molecular structures and do not break down through chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above Earth's surface, are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane

[15] U.S. EPA. High Global Warming Potential (GWP) Gases. http://www.epa.gov/highgwp/scientific.html

(CF_4) and hexafluoroethane (C_2F_6). The U.S. EPA estimates that concentrations of CF_4 in the atmosphere are over 70 ppt.[16]

No health effects are known to result from exposure to PFCs. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur Hexafluoride: Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated (23,900). The U.S. EPA indicates that concentrations in the 1990s were about 4 ppt.[17] In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.

Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

2.5 EFFECTS OF CLIMATE CHANGE IN CALIFORNIA

The California Environmental Protection Agency (CalEPA) published a report titled "Scenarios of Climate Change in California: An Overview" (Climate Scenarios report) in February 2006 (California Climate Change Center 2006), that while not adequate for a CEQA project-specific or cumulative analysis, is generally instructive about the statewide impacts of global warming.

The Climate Scenarios report uses a range of emissions scenarios developed by the Intergovernmental Panel on Climate Change (IPCC) to project a series of potential warming ranges (i.e., temperature increases) that may occur in California during the 21st century: lower warming range (3.0-5.5^{o}F); medium warming range (5.5-8.0^{o}F); and higher warming range (8.0-10.5^{o}F). The Climate Scenarios report then presents an analysis of future climate in California under each warming range, that while uncertain, present a picture of the impacts of global climate change trends in California.

In addition, most recently on August 5, 2009, the State's Natural Resources Agency released a public review draft of its "California Climate Adaptation Strategy" report that details many vulnerabilities arising from climate change with respect to matters such as temperature extremes, sea level rise, wildfires,

[16] ibid.
[17] ibid.

floods and droughts and precipitation changes. This report responds to the Governor's Executive Order S-13-2008 that called on state agencies to develop California's strategy to identify and prepare for expected climate impacts

According to the reports, substantial temperature increases arising from increased GHG emissions potentially could result in a variety of impacts to the people, economy, and environment of California associated with a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. Under the emissions scenarios of the Climate Scenarios report, the impacts of global warming in California have the potential to include, but are not limited to, the following areas:

Public Health

According to Cal EPA, higher temperatures may increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation could increase from 25 to 35 percent under the lower warming range to 75 to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become difficult to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances, depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming range scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures could increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Water Resources

A vast network of man-made reservoirs and aqueducts captures and transports water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snowpack to supply water during the dry spring and summer months. Rising

temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

If temperatures continue to increase, more precipitation could fall as rain instead of snow, and the snow that does fall could melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. Under the lower warming range scenario, snowpack losses could be only half as large as those possible if temperatures were to rise to the higher warming range. How much snowpack could be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snowpack could pose challenges to water managers and hamper hydropower generation. It could also adversely affect winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater could degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta – a major fresh water supply.

Agriculture

Increased temperatures could cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25 percent of the water supply they need. Although higher CO_2 levels can stimulate plant production and increase plant water-use efficiency, California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate O_3 pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising

temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts.

In addition, continued global climate change could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued global climate change could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In contrast, wildfires in northern California could increase by up to 90 percent due to decreased precipitation.

Moreover, continued global climate change has the potential to alter natural ecosystems and biological diversity within the state. For example, alpine and subalpine ecosystems could decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests has the potential to decrease as a result of global climate change.

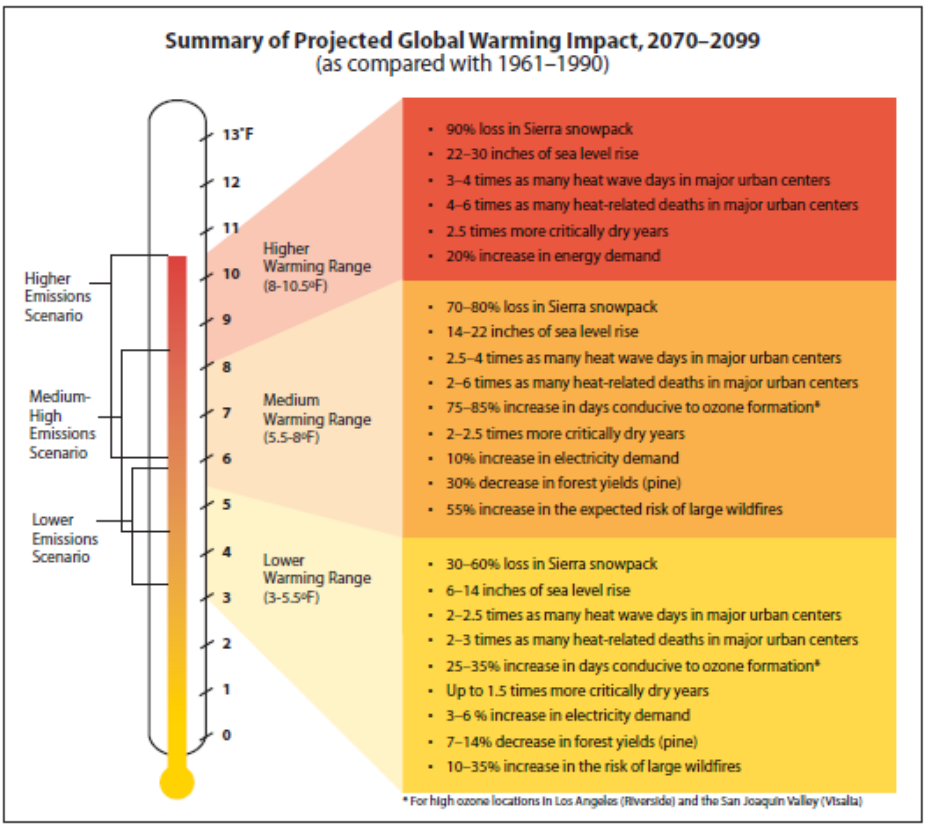
Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Under the higher warming range scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate low-lying coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats. Under the lower warming range scenario, sea level could rise 12-14 inches.

2.6 HUMAN HEALTH EFFECTS

The potential health effects related directly to the emissions of carbon dioxide, methane, and nitrous oxide as they relate to development projects such as the proposed Project are still being debated in the scientific community. Their cumulative effects to global climate change have the potential to cause adverse effects to human health. Increases in Earth's ambient temperatures would result in more intense heat waves, causing more heat-related deaths. Scientists also purport that higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas (American Lung Association, 2004). Figure 1 presents the potential impacts of global warming.

FIGURE 1



Source: California Energy Commission, 2006. Our Changing Climate, Assessing the Risks to California, 2006 Biennial Report.

Specific health effects associated with directly emitted GHG emissions are as follows:

Water Vapor: There are no known direct health effects related to water vapor at this time. It should be noted however that when some pollutants react with water vapor, the reaction forms a transport mechanism for some of these pollutants to enter the human body through water vapor.

Carbon Dioxide: According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of carbon dioxide can result in health effects such as: headaches, dizziness, restlessness, difficulty breathing, sweating, increased heart rate, increased cardiac output, increased blood pressure, coma, asphyxia, and/or convulsions. It should be noted that current concentrations of carbon dioxide in the earth's atmosphere are estimated to be approximately 370 parts per million (ppm), the actual reference exposure level (level at which adverse health effects typically occur) is at exposure levels of 5,000 ppm averaged over 10 hours in a 40-hour workweek and short-term reference exposure levels of 30,000 ppm averaged over a 15 minute period (NIOSH 2005).

Methane: Methane is extremely reactive with oxidizers, halogens, and other halogen-containing compounds. Methane is also an asphyxiant and may displace oxygen in an enclosed space (OSHA 2003).

Nitrous Oxide: Nitrous Oxide is often referred to as laughing gas; it is a colorless greenhouse gas. The health effects associated with exposure to elevated concentrations of nitrous oxide include dizziness, euphoria, slight hallucinations, and in extreme cases of elevated concentrations nitrous oxide can also cause brain damage (OSHA 1999).

Fluorinated Gases: High concentrations of fluorinated gases can also result in adverse health effects such as asphyxiation, dizziness, headache, cardiovascular disease, cardiac disorders, and in extreme cases, increased mortality (NIOSH 1989, 1997).

Aerosols: The health effects of aerosols are similar to that of other fine particulate matter. Thus aerosols can cause elevated respiratory and cardiovascular diseases as well as increased mortality (NASA 2002).

2.7 REGULATORY SETTING

International Regulation and the Kyoto Protocol:

In 1988, the United Nations established the Intergovernmental Panel on Climate Change to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined other countries around the world in signing the United Nations' Framework Convention on Climate Change (UNFCCC) agreement with the goal of controlling greenhouse gas emissions. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The Plan currently consists of more than 50 voluntary programs for member nations to adopt.

The Kyoto protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. Some have estimated that if the commitments outlined in the Kyoto protocol are met, global GHG emissions could be reduced an estimated five percent from 1990 levels during the first commitment period of 2008-2012. Notably, while the United States is a signatory to the Kyoto protocol, Congress has not ratified the Protocol and the United States is not bound by the Protocol's commitments. In December 2009, international leaders from 192 nations met in Copenhagen to address the future of international climate change commitments post-Kyoto.

Federal Regulation and the Clean Air Act:

Coinciding 2009 meeting in Copenhagen, on December 7, 2009, the U.S. Environmental Protection Agency (EPA) issued an Endangerment Finding under Section 202(a) of the Clean Air Act, opening the door to federal regulation of GHGs. The Endangerment Finding notes that GHGs threaten public health and welfare and are subject to regulation under the Clean Air Act. To date, the EPA has not promulgated regulations on GHG emissions, but it has already begun to develop them.

Previously the EPA had not regulated GHGs under the Clean Air Act because it asserted that the Act did not authorize it to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. In *Massachusetts v. Environmental Protection Agency et al.* (127 S. Ct. 1438 (2007), however, the U.S. Supreme Court held that GHGs are pollutants under the Clean Air Act and directed the EPA to decide whether the gases endangered public health or welfare. The EPA had also not moved aggressively to regulate GHGs because it expected Congress to make progress on GHG legislation, primarily from the standpoint of a cap-and-trade system. However,

proposals circulated in both the House of Representative and Senate have been controversial and it may be some time before the U.S. Congress adopts major climate change legislation. The EPA's Endangerment Finding paves the way for federal regulation of GHGs with or without Congress.

Although global climate change did not become an international concern until the 1980s, efforts to reduce energy consumption began in California in response to the oil crisis in the 1970s, resulting in the incidental reduction of greenhouse gas emissions. In order to manage the state's energy needs and promote energy efficiency, AB 1575 created the California Energy Commission (CEC) in 1975.

Title 24 Energy Standards:

The California Energy Commission (CEC) first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency, and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods. The latest revisions were adopted in 2008 and became effective on January 1, 2010.

Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code). The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality."[18] The CALGreen Code is not intended to substitute or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission (CBSC). The CBSC has released the *2010 California Green Building Standards Code* on its Web site.[19] Unless otherwise noted in the regulation, all newly constructed buildings in California are subject of the requirements of the CALGreen Code.

[18] California Building Standards Commission, 2008 California Green Building Standards Code, (2009).
[19] "CALGreen," http://www.bsc.ca.gov/CALGreen/default.htm. 2010

California Assembly Bill No. 1493 (AB 1493):

AB 1493 requires CARB to develop and adopt the nation's first greenhouse gas emission standards for automobiles. The Legislature declared in AB 1493 that global warming was a matter of increasing concern for public health and environment in California. Further, the legislature stated that technological solutions to reduce greenhouse gas emissions would stimulate the California economy and provide jobs.

To meet the requirements of AB 1493, ARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California's existing motor vehicle emission standards in 2004. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961) and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016.

In December 2004 a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of CCR 13 1900 and CCR 13 1961 as amended by AB 1493 and CCR 13 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon*, in her official capacity as Executive Director of the California Air Resources Board, et al.). The suit, heard in the U.S. District Court for the Eastern District of California, contended that California's implementation of regulations that in effect regulate vehicle fuel economy violates various federal laws, regulations, and policies. In January 2007, the judge hearing the case accepted a request from the State Attorney General's office that the trial be postponed until a decision is reached by the U.S. Supreme Court on a separate case addressing GHGs. In the Supreme Court Case, *Massachusetts vs. EPA*, the primary issue in question is whether the federal CAA provides authority for USEPA to regulate CO2 emissions. In April 2007, the U.S. Supreme Court ruled in Massachusetts' favor, holding that GHGs are air pollutants under the CAA. On December 11, 2007, the judge in the *Central Valley Chrysler-Jeep* case rejected each plaintiff's arguments and ruled in California's favor. On December 19, 2007, the USEPA denied California's waiver request. California filed a petition with the Ninth Circuit Court of Appeals challenging USEPA's denial on January 2, 2008.

The Obama administration subsequently directed the USEPA to re-examine their decision. On May 19, 2009, challenging parties, automakers, the State of California, and the federal government reached an agreement on a series of actions that would resolve these current and potential future disputes over the

standards through model year 2016. In summary, the USEPA and the U.S. Department of Transportation agreed to adopt a federal program to reduce GHGs and improve fuel economy, respectively, from passenger vehicles in order to achieve equivalent or greater greenhouse gas benefits as the AB 1493 regulations for the 2012–2016 model years. Manufacturers agreed to ultimately drop current and forego similar future legal challenges, including challenging a waiver grant, which occurred on June 30, 2009. The State of California committed to (1) revise its standards to allow manufacturers to demonstrate compliance with the fleet-average GHG emission standard by "pooling" California and specified State vehicle sales; (2) revise its standards for 2012–2016 model year vehicles so that compliance with USEPA-adopted GHG standards would also comply with California's standards; and (3) revise its standards, as necessary, to allow manufacturers to use emissions data from the federal CAFE program to demonstrate compliance with the AB 1493 regulations (CARB 2009, http://www.arb.ca.gov/regact/2009/ghgpv09/ghgpvisor.pdf) both of these programs are aimed at light-duty auto and light-duty trucks.

Executive Order S-3-05:

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 1990 level by 2020, and to 80% below the 1990 level by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary also is required to submit biannual reports to the Governor and state Legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the CalEPA created a Climate Action Team (CAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

California Assembly Bill 32 (AB 32):

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020.

This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

In November 2007, CARB completed its estimates of 1990 GHG levels. Net emission 1990 levels were estimated at 427 MMTs (emission sources by sector were: transportation – 35 percent; electricity generation – 26 percent; industrial – 24 percent; residential – 7 percent; agriculture – 5 percent; and commercial – 3 percent)[20]. Accordingly, 427 MMTs of CO2 equivalent was established as the emissions limit for 2020. For comparison, CARB's estimate for baseline GHG emissions was 473 MMT for 2000 and 532 MMT for 2010. "Business as usual" conditions (without the 30 percent reduction to be implemented by CARB regulations) for 2020 were projected to be 596 MMTs.

In December 2007, CARB approved a regulation for mandatory reporting and verification of GHG emissions for major sources. This regulation covered major stationary sources such as cement plans, oil refineries, electric generating facilities/providers, and co-generation facilities, which comprise 94 percent of the point source CO2 emissions in the State.

On December 11, 2008, CARB adopted a scoping plan to reduce GHG emissions to 1990 levels. The Scoping Plan's recommendations for reducing GHG emissions to 1990 levels by 2020 include emission reduction measures, including a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, as well as Voluntary

[20] On a national level, the EPA's Endangerment Finding stated that electricity generation is the largest emitting sector (34%), followed by transportation (28%), and industry (19%).

Early Actions and Reductions. Implementation of individual measures must begin no later than January 1, 2012, so that the emissions reduction target can be fully achieved by 2020.

Table 2-3 shows the proposed reductions from regulations and programs outlined in the Scoping Plan. While local government operations were not accounted for in achieving the 2020 emissions reduction, local land use changes are estimated to result in a reduction of 5 MMTons of CO2e, which is approximately 3 percent of the 2020 GHG emissions reduction goal. In recognition of the critical role local governments will play in successful implementation of AB 32, CARB is recommending GHG reduction goals of 15 percent of 2006 levels by 2020 to ensure that municipal and community-wide emissions match the state's reduction target. According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 MMTons tons of CO2e (or approximately 1.2 percent of the GHG reduction target).

California Senate Bill No. 1368 (SB 1368):

In 2006, the State Legislature adopted Senate Bill 1368 ("SB 1368"), which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission ("CPUC") to adopt a greenhouse gas emission performance standard ("EPS") for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than five years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Due to the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law will effectively prevent California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. Thus, SB 1368 will lead to dramatically lower greenhouse gas emissions associated with California energy demand, as SB 1368 will effectively prohibit California utilities from purchasing power from out of state producers that cannot satisfy the EPS standard required by SB 1368.

TABLE 2-3

SCOPING PLAN GHG REDUCTION MEASURES TOWARD 2020 TARGET

Recommended Reduction Measures	*Reductions Counted toward 2020 Target of 169 MMT CO2e*	*Percentage of Statewide 2020 Target*
Cap and Trade Program and Associated Measures		
California Light-Duty Vehicle GHG Standards	**31.7**	**19%**
Energy Efficiency	**26.3**	**16%**
Renewable Portfolio Standard (33 percent by 2020)	**21.3**	**13%**
Low Carbon Fuel Standard	**15**	**9%**
Regional Transportation-Related GHG Targets1	**5**	**3%**
Vehicle Efficiency Measures	**4.5**	**3%**
Goods Movement	**3.7**	**2%**
Million Solar Roofs	**2.1**	**1%**
Medium/Heavy Duty Vehicles	**1.4**	**1%**
High Speed Rail	**1.0**	**1%**
Industrial Measures	**0.3**	**0%**
Additional Reduction Necessary to Achieve Cap	**34.4**	**20%**
Total Cap and Trade Program Reductions	**146.7**	**87%**
Uncapped Sources/Sectors Measures		
High Global Warming Potential Gas Measures	**20.2**	**12%**
Sustainable Forests	**5**	**3%**
Industrial Measures (for sources not covered under cap and trade program)	**1.1**	**1%**
Recycling and Waste (landfill methane capture)	**1**	**1%**
Total Uncapped Sources/Sectors Reductions	**27.3**	**16%**
Total Reductions Counted toward 2020 Target	**174**	**100%**
Other Recommended Measures – Not Counted toward 2020 Target		
State Government Operations	**1.0 to 2.0**	**1%**
Local Government Operations	**To Be Determined2**	**NA**
Green Buildings	**26**	**15%**
Recycling and Waste	**9**	**5%**
Water Sector Measures	**4.8**	**3%**
Methane Capture at Large Dairies	**1**	**1%**
Total Other Recommended Measures – Not Counted toward 2020 Target	**42.8**	**NA**

Source: CARB. 2008, MMTons CO2e: million metric tons of CO2e 1 Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. 2 According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 million metric tons of CO2e (or approximately 1.2 percent of the GHG reduction target). However, these reductions were not included in the Scoping Plan reductions to achieve the 2020 Target

Senate Bill 97 (SB 97):

Pursuant to the direction of SB 97, OPR released preliminary draft CEQA Guideline amendments for greenhouse gas emissions on January 8, 2009, and submitted its final proposed guidelines to the Secretary for Natural Resources on April 13, 2009. The Natural Resources Agency adopted the Guideline amendments and they became effective on March 18, 2010.

Of note, the new guidelines state that a lead agency shall have discretion to determine whether to use a quantitative model or methodology, or in the alternative, rely on a qualitative analysis or performance based standards. CEQA Guideline § 15064.4(a)"A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use . . .; or (2) Rely on a qualitative analysis or performance based standards."

CEQA emphasizes that the effects of greenhouse gas emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis. (See CEQA Guidelines Section 15130(f)).

Section 15064.4(b) of the CEQA Guidelines provides direction for lead agencies for assessing the significance of impacts of greenhouse gas emissions:

1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; or

3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

The CEQA Guideline amendments do not identify a threshold of significance for greenhouse gas emissions, nor do they prescribe assessment methodologies or specific mitigation measures. Instead, they call for a "good-faith effort, based on available information, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." The amendments encourage lead agencies to consider many factors in performing a CEQA analysis and preserve lead agencies' discretion to make their own determinations based upon substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses. Specific GHG language incorporated in the Guidelines' suggested Environmental Checklist (Guidelines Appendix G) is as follows:

VII. GREENHOUSE GAS EMISSIONS

Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Executive Order S-01-07:

On January 18, 2007 California Governor Arnold Schwarzenegger, through Executive Order S-01-07, mandated a statewide goal to reduce the carbon intensity of California's transportation fuel by at least ten percent by 2020. The order also requires that a California specific Low Carbon Fuel Standard be established for transportation fuels.

Senate Bills 1078 and 107 and Executive Order S-14-08:

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008 Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Energy Standard to 33% renewable power by 2020.

Senate Bill 375:

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPO's regional transportation plan. ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012.

This law also extends the minimum time period for the regional housing needs allocation cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

CARB's Preliminary Draft Staff Proposal for Interim Significance Thresholds:

Separate from its Scoping Plan approved in December of 2008, CARB issued a Staff Proposal in October 2008, as its first step toward developing recommended statewide interim thresholds of significance for GHGs that may be adopted by local agencies for their own use. CARB staff's objective in this proposal is to develop a threshold of significance that will result in the vast majority (approximately 90 percent statewide) of GHG emissions from new industrial projects being subject to CEQA's requirement to impose feasible mitigation. The proposal does not attempt to address every type of project that may be subject to CEQA, but instead focuses on common project types that, collectively, are responsible for substantial GHG emissions – specifically, industrial, residential, and commercial projects. CARB is developing these thresholds in these sectors to advance climate objectives, streamline project review, and encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state. These draft thresholds are under revision in response to comments. There is currently no timetable for finalized thresholds at this time.

As currently proposed by CARB, the threshold consists of a quantitative threshold of 7,000 metric tons (MT) of CO2e per year for operational emissions (excluding transportation), and performance standards for construction and transportation emissions. These performance standards have not yet been developed.

However, CARB's proposal is not yet final, and thus cannot be applied to the Project. Further, CARB's proposal sets forth draft thresholds for industrial projects that have high operational stationary GHG emissions, such as manufacturing plants, or uses that utilize combustion engines. Thus, mobile source emissions are not addressed. This Project's GHG emissions are mostly from mobile sources, and as such, the CARB proposal is not applicable to the Project.[21]

2.9 DISCUSSION ON ESTABLISHMENT OF SIGNIFICANCE THRESHOLDS

In 2006, Governor Arnold Schwarzenegger signed Assembly Bill 32 (AB32), which charged the California Air Resources Board (CARB) with developing regulations on how the State should address climate change. The CARB, California Environmental Protection Agency (Cal EPA), the U.S. Environmental Protection Agency (EPA), the South Coast Air Quality Management District (SCAQMD) or other appropriate governmental organizations have not yet developed formal guidelines on how to prepare a California Environmental Quality Act (CEQA) assessment for climate change. Pursuant to the direction of SB 97, OPR released preliminary draft CEQA Guideline amendments for greenhouse gas emissions on January 8, 2009, and submitted its final proposed guidelines to the Secretary for Natural Resources on April 13, 2009. The Natural Resources Agency adopted the Guideline amendments and they became operative on January 1, 2010. Of note, the new guidelines state that a lead agency shall have discretion to determine whether to use a quantitative model or methodology, or in the alternative, rely on a qualitative analysis or performance based standards. New CEQA Guideline § 15064.4(a)"A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use . . .; or (2) Rely on a qualitative analysis or performance based standards."

The CEQA Guideline amendments do not identify a numeric threshold of significance for greenhouse gas emissions, nor do they prescribe assessment methodologies or specific mitigation measures. Instead, they call for a "good-faith effort, based on available information, to describe, calculate or

[21] http://www.arb.ca.gov/cc/localgov/ceqa/meetings/102708/prelimdraftproposal102408.pdf

estimate the amount of greenhouse gas emissions resulting from a project." The amendments encourage lead agencies to consider many factors in performing a CEQA analysis and preserve lead agencies' discretion to make their own determinations based upon substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

Based on the memorandum *Industrial Use / East Otay Mesa Specific Plan DPLU Interim Guidance for Greenhouse Gas (GHG) Analysis, Dated May 7, 2010:* Until further direction is provided by the State, the County's interim guideline for determining significance is whether the project would conflict with implementation of AB32, the Global Warming Solutions Act of 2006. To demonstrate the project will not conflict with implementation of AB32, the project needs to demonstrate the following:

- Light Industrial / Non-Stationary Source Uses: The project would reduce overall carbon emissions to 33% below business as usual. The 33% reduction should be an overall reduction for operational emissions, construction-related emissions and vehicular-related emissions.

- Heavy Industrial / Stationary Uses: Until the County of San Diego establishes its own significance threshold for Heavy Industrial / Stationary Source Uses, applicants should rely on the 10,000 metric tons of CO2 (or equivalent) per year threshold, identified by the South Coast Air Quality Management District (SCAQMD). The 10,000 metric ton threshold was found to capture more than 90% of emissions from stationary source projects in the South Coast air basin. The County is working towards establishing a threshold that is specifically suited to conditions in the San Diego region.

- All uses: Since construction-related GHG emissions are for a limited period of time, construction-related GHG emissions should be amortized over a 30-year period and added to the operational emissions.

Business as usual is defined as emissions that would be generated prior to AB32 related emission restrictions beginning in 2006 (e.g., 2005 Title 24 building standards).

For purposes of this analysis, the project is classified as a Heavy Industrial / Stationary Source Use and therefore the applicable threshold identified for a Heavy Industrial / Stationary Source Use (10,000 metric tons) applies.

3.0 PROJECT GREENHOUSE GAS IMPACT

3.1 PROJECT RELATED GREENHOUSE GAS EMISSIONS

GHG emissions from the Project will result from operations associated with the aggregate production rate of 1.2 million tons per year. More specifically, emissions associated with the project include: Hot Mix Asphalt Plant – Combustion, Facility Vehicles – On-site Equipment, Electricity Usage, and Mobile Source emissions associated with Quarry operations.

3.2 LIFE-CYCLE ANALYSIS

A full life-cycle analysis (LCA) is not included in this analysis due to the lack of consensus guidance on LCA methodology at this time.[22] Life-cycle analysis (i.e., assessing economy-wide GHG emissions from the processes in manufacturing and transporting all raw materials used in the project development and infrastructure) depends on emission factors or econometric factors that are not well established for all processes. At this time a LCA would be extremely speculative and thus has not been prepared.

3.3 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of CO2, CH4, and N2O from the following primary sources:

- Hot-Mix Asphalt Plant - Combustion
- Facility Vehicles – On-site Equipment
- Electricity Usage
- Mobile Source Emissions

3.3.1 HOT-MIX ASPHALT PLANT - COMBUSTION

GHGs are emitted from combustion activities related to the Hot-Mix Asphalt Plant and include emissions associated with Dryer Burner/Baghouse and Hot Oil Heater operations. Emission factors for combustion-related GHG emissions (CO2, N2O and CH4) are provided by the United States

[22] California Natural Resources Agency, *Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97,* December 2009.

Environmental Protection Agency (US EPA) in *Emission Factors & AP 42, Compilation of Air Pollutant Emission Factors*. Section's 1.4 and 11.1 of AP 42 were utilized to calculate GHG emissions associated with combustion activity. Detailed calculations are provided in Appendix "A" for review.

3.3.2 FACILITY VEHICLES – ON SITE EQUIPMENT

Heavy-duty on-site construction equipment that is required based on the 1996 EIR includes: (1) Drilling Equipment and (1) Portable Jaw Crusher. Equipment is assumed to be operational for 10 hours per day 312 days per year. Detailed calculations are provided in Appendix "A" for review.

Heavy-duty on-site construction equipment that is required for the proposed MUP modification includes: (1) Drilling Equipment, a (1) Portable Jaw Crusher, (1) CAT 385B Excavator, (2) CAT 773F Ridge Frame Rock Trucks, (1) CAT 980H Loader, and (1) CAT 613C Water Wagon. Equipment is assumed to be operational for 10 hours per day 312 days per year with the exception of the CAT 980H Loader and the CAT 613C Water Wagon which are assumed to be operational for 4 hours per day 312 days per year. Detailed calculations are provided in Appendix "A" for review.

3.3.3 ELECTRICITY USAGE

Electricity usage required to operate the Hot-Mix Asphalt Plant and other aspects of the Project is estimated to be 2.29 mega-watts (MW) per day[23] on average. In order to estimate GHG emissions associated with Electricity Usage, it is assumed that 2.29MW would be required for 312 days per year for 9 hours per day. The resulting annual Energy Usage in kilowatt-hours (kWh) is multiplied by the applicable CO2, N2O and CH4 emission factors per kWh available from the Local Government Operations Protocol. Detailed calculations are provided in Appendix "A" for review.

Additionally, for the calculations based on the 1996 EIR, an electric shovel (CAT 7295 – Electric Rope Shovel) is also required. It is assumed that the electric shovel will operate for 9 hours per day 312 days per year (with average demand of 600 kW)[24]. Detailed calculations are provided in Appendix "A" for review.

[23] 2.29MW per hour for 312 days for 9 hours per day are estimated for on-site electricity consumption based on detailed inventory of on-site demand provided by project applicant. A detailed breakdown of electricity demand is provided in Appendix "A". This detailed breakdown was submitted by the applicant to SDG&E to size the electrical distribution system.

[24] 600 kWh average demand based on CAT 7295 Electric Rope Shovel operating 312 days for 9 hours per day. Information provided by project applicant, a detailed breakdown of the electricity demand is provided in Appendix "A". This detailed breakdown was submitted by the applicant to SDG&E to size the electrical distribution system.

3.3.4 MOBILE SOURCE EMISSIONS

GHG emissions will also result from mobile sources associated with the Project. These mobile source emissions will result from the typical daily operation of motor vehicles by visitors, employees, and customers.

The 1996 EIR limits the number of project trips to 514 Average Daily Trips (ADT) as follows:

Sand Importation	17 trips x 2 trip ends per day	= 34 trips per day
Ready-Mix	68 trips x 2 trip ends per day	= 136 trips per day
Aggregate	141 trips x 2 trip ends per day	= 282 trips per day
Employee	31 trips x 2 trip ends per day	= 62 trips per day
Total		= 514 trips per day

It should be noted however, that although there will potentially be 514 trips per day travelling to/from the Project. Not all the trips can or should be attributed to the Project. As noted in the 1996 EIR, the Rosemary Mountain Quarry's purpose is to avoid the high cost of aggregate imported from Riverside County as several San Diego County operations were scheduled to close due to material exhaustion and permit expiration. More specifically the 1996 EIR Project Description identifies six (6) Existing Sources serving North San Diego County (1.Twin Oaks Quarry, 2.South Coast Quarry, 3.Wyrock, 4.Harmony Grove, 5.Calmat-Pala, and 6.San Marcos). Of the 6 existing sources, four (4) have closed, with only the Wyrock and Harmony Grove sites still active on an intermittent basis. Therefore the Rosemary Mountain Quarry Project will serve a regional need and will actually reduce vehicle miles traveled (VMT) by diverting trips that would otherwise travel to Riverside County and elsewhere. A more detailed discussion is provided below.

The fact is that aggregate will be consumed with or without the proposed Project. The Project will not have an effect on demand for aggregate but will have an effect on the distance that aggregates travel within the region. Project aggregate will replace materials hauled from farther distances and supply new demand for aggregate that will occur in the North San Diego County region. This rationale is supported by Dr. Peter Berk's "*Working Paper No. 994 – A Note on the Environmental Costs of Aggregate"* (Department of Agricultural and Resource Economics and Policy, Division of Agricultural and Natural Resources, University of California Berkley, January 2005). Dr. Berck states that:

"The opening of a new quarry for aggregates will change the pattern of transportation of aggregates in the area served by the quarry. In this note, we will show that, so long as aggregate producers are cost minimizing, the new pattern of transportation requires less truck transport than the pattern of transportation that existed before the opening of the new quarry. Since the costs of providing aggregates falls, it is reasonable to assume that the price of delivered aggregates also will fall. This note also shows that the demand expansion effect is of very small magnitude. Since the demand increase from a new quarry is quite small, the dominant effect is that the quarries are on average closer to the users of aggregates and, as a result, the truck mileage for aggregate hauling decreases. To summarize the effects of a new quarry project:

a) The project in itself will not significantly increase the demand for construction materials in the region through market forces, which include the downward pressure on pricing.

b) Truck traffic (i.e. vehicle miles traveled) in the region will not increase and may decrease as a result of the project."

In its guidance document *CEQA and Climate Change* the California Air Pollution Control Officers Association (CAPCOA) lists various mitigation measures that can be implemented to reduce GHG emissions for various projects. One particular mitigation measure for reducing GHG emissions during construction activity is Mitigation Measure C-5 "Use of Local Building Materials." The Project will provide local building materials to projects throughout north San Diego County, thus resulting in a reduction in emissions associated with transport of materials from outlying suppliers of aggregate, asphalt, and concrete products.

To evaluate the GHG emissions associated with supplying materials from the Project versus other facilities, twelve (12) facilities that could supply building materials were identified within north San Diego County as shown on Table 3-1.

TABLE 3-1

ASPHALT AND AGGREGATE SUPPLIERS – NORTH SAN DIEGO COUNTY

Facility	Address	Production (asphalt/concrete/both)
Harmony Grove Aggregates	Country Club Drive and Harmony Grove, Escondido	Aggregates
Inland Valley Materials[25]	14080 San Pasqual Valley Road, Escondido	Both
Escondido Asphalt	500 N. Tulip Street, Escondido	Asphalt
Superior Ready Mix Oceanside	3227 Oceanside Boulevard, Oceanside	Concrete
Superior Ready Mix Escondido	1508 Mission Road, Escondido	Concrete
Superior Ready Mix Fallbrook	1415 Alturas Road, Fallbrook	Concrete
National Quarries (Wyrock)	28474 N. Twin Oaks Valley Road, San Marcos	Aggregates
Palomar Transit Mix Escondido	849 W. Washington Avenue, Escondido	Concrete
Palomar Transit Mix Oceanside	2529 Industry Street, Oceanside	Concrete
Hanson Oceanside	1050 Airport Road, Oceanside	Concrete
Hanson Escondido	550 N. Tulip Street, Escondido	Concrete
Cemex	29065 Old Town Front Street, Temecula	Concrete

The next step in evaluating GHG emissions from the Project versus from vehicles supplying material to north San Diego County was to identify major construction and development projects that would be likely to utilize asphalt, concrete, and aggregates from the Project. Projects were identified by reviewing the San Diego Association of Governments (SANDAG) 2030 Regional Transportation Plan and Retional Transportation Improvement Program, which provided information on major transportation projects planned for the northern half of San Diego County. Additionally, major development areas were identified in consultation with the project applicant. The following list provides a summary of public transportation projects and other development opportunities anticipated for northern San Diego County and within proximate distances from the proposed Project:

Major Transportation Projects in North San Diego County Region

1. Highway 76 from Mission Road to Interstate 15 – 5 miles
2. Highway 76 and Interstate 15 Interchange – 2 miles
3. Toll Lanes North from Escondido to County Line – 5 miles

Major Development Areas

1. Meadow Wood Residential Project – 2 miles
2. Palomar Extension Campus – 3 miles
3. Camp Pendleton – 21 miles

[25] It should be noted that reserves at Inland Valley Materials are extremely low and the quality of the product does not meet Caltrans specifications. Therefore, material from this site would likely not be used for major transportation projects, however for analysis purposes, the site is included to ensure a conservative estimate of emissions.

4. El Corazon Oceanside (465 acres) – 17 miles

In general distances provided were based on a central point, or the farthest distance from the Project site to provide a conservative estimate of the distance required to supply materials from the proposed Project. Figure 2 shows the locations of the asphalt, concrete, and aggregate suppliers within north County relative to the locations of the major construction projects.

Because it is reasonable to assume that construction projects would typically bring concrete and asphalt from suppliers within 25 miles from a given construction site, only facilities located within 25 miles of a construction project were considered in the calculation. It should be noted that in some cases, facilities would supply projects from a distance greater than 25 miles due to factors such as price, availability, etc. For purposes of this analysis, to estimate GHG emissions from other suppliers, an average distance that would be traveled from the facilities to the construction projects were calculated, considering the 25-mile distance as the typical maximum distance from which concrete or asphalt would be supplied[26]. EMFAC 2011 emission factors were used to calculate mobile source GHG emissions. Detailed calculations are provided in Appendix "A" for review. For employee and sand importation, an average two-way trip length of 40 miles is assumed as a conservative measure.

EMFAC 2011 provides CO2 emissions in grams per mile for all vehicle classes. For purposes of this analysis the three relevant vehicle classes are: light duty auto (gasoline), light duty truck (diesel), and T6 instate construction heavy (diesel). For Sand Import, Ready-Mix, and Aggregate related activities, all Trucks are assumed to be T6 instate construction heavy (diesel). For Employee trips 50% are assumed to be light duty auto (gasoline) and 50% are assumed to be light duty truck (diesel). Accordingly, EMFAC2011 provides CO2 emission factors without and with the Pavley I and the Low Carbon Fuel Standards (LCFS).

For the Project based on the 1996 EIR (Table 3-2), no credit was taken for the implementation of Pavley I and the LCFS.

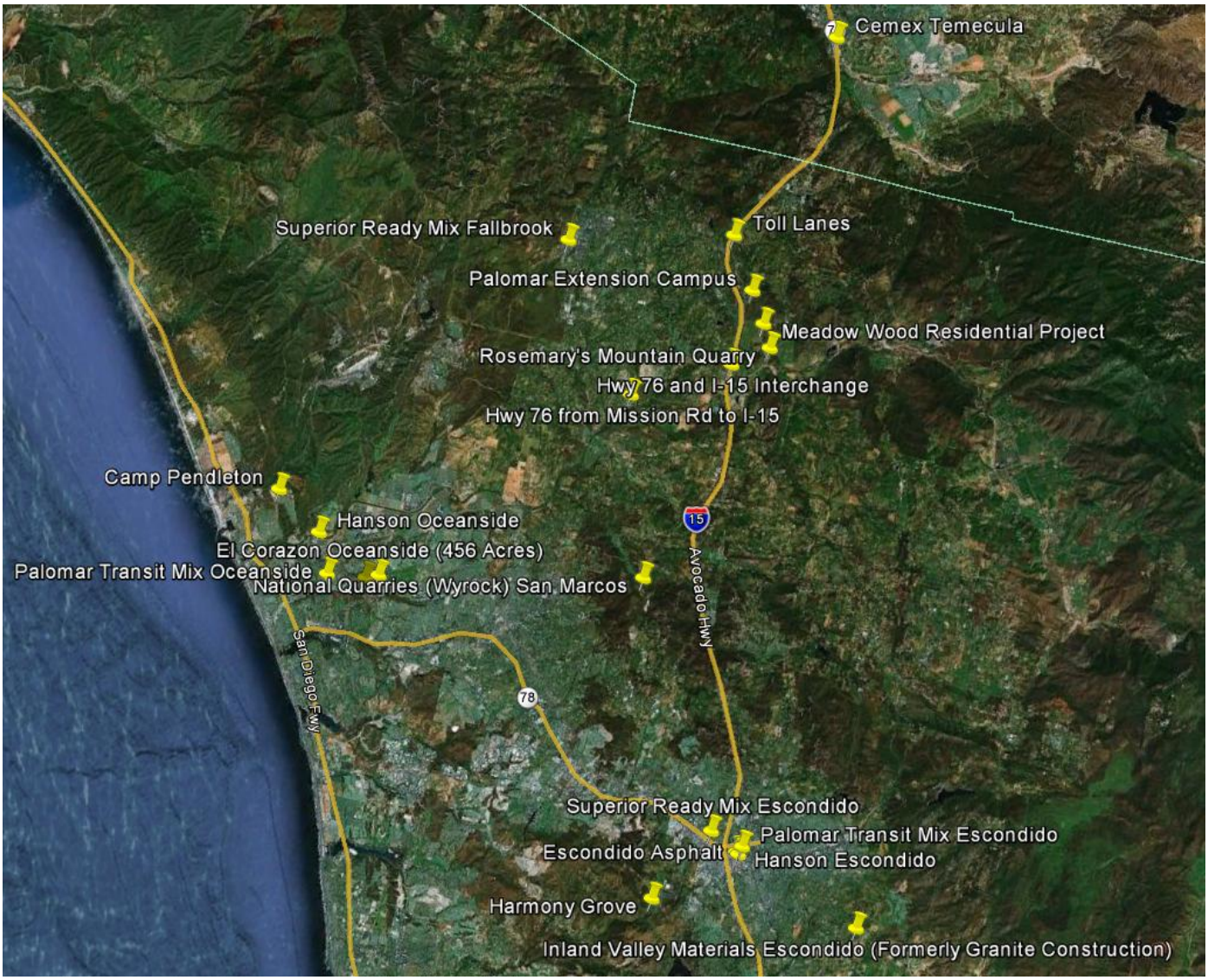
For the Proposed Project with MUP Modification (Table 3-3), credit was taken for the implementation of Pavley I and the LCFS as part of the EMFAC2011 model run, no manual post-processing was required. Additionally, it should be noted that Pavley I only applies to passenger and light duty trucks therefore the model does not take any credit for T6 instate construction heavy (diesel) trucks. Although the LCFS does apply to all vehicle classes, for analysis purposes it applies only to emissions of CO2 and CH4.

[26] SANDAG's *San Diego Region Aggregate Supply Study* determined that the point of diminishing marginal benefit—that is, where the largest number of projects can be served with the least additional distance—occurs at the 20- to 25-mile driveshed. In addition, the Working Paper No. 994 by Peter Beck states that the cost of construction aggregate doubles every 25-35 miles from the point of production. As such 25 miles was used in this analysis and is deemed appropriate.

Appendix “A” provides detailed vehicle emission calculations and provides a summary of the CO2 emission rates without and with Pavley I and LCFS for each applicable vehicle class.

Tables 3-1 and 3-2 also provide a summary of the net reduction in vehicular GHG emissions that would be realized through the use of local building materials from the proposed Project.

FIGURE 2



Source: Google Earth®, Imagery Date: 9/16/2011

3.4 EMISSIONS SUMMARY

The summary of annual operational GHG emissions is reported in Table 3-2 (Project based on 1996 EIR) and Table 3-3 (Proposed Project with MUP Modification).

TABLE 3-2

TOTAL PROJECT GREENHOUSE GAS EMISSIONS (BASED ON 1996 EIR ASSUMPTIONS) (ANNUAL) (METRIC TONS PER YEAR)

	Emissions (metric tons per year)		
Emission Source	**CO_2**	**CH_4**	**N_2O**
Hot-Mix Aspahlt Plant	2,561	0.6	0.6
Facility Vehicles – On-Site Equipment	878	0.08	NG
Electricity Usage	2,874.05	0.11	0.04
Mobile Sources[1]	1,758.63	--	--
Net Reduction	*(2,235.03)*	--	--
Total CO_2E (All Sources)		**6,051.64**	
Threshold		**10,000**	
Significant?		**NO**	

Source: See Appendix "A" for detailed calculations.
NG = Negligible
[1] EMFAC 2011 provides only CO2 emissions output

TABLE 3-3

TOTAL PROJECT GREENHOUSE GAS EMISSIONS (PROPOSED MUP MODIFICATIONS) (ANNUAL) (METRIC TONS PER YEAR)

	Emissions (metric tons per year)		
Emission Source	**CO_2**	**CH_4**	**N_2O**
Hot-Mix Aspahlt Plant	2,561	0.6	0.6
Facility Vehicles – On-Site Equipment	3,338	0.29	NG
Electricity Usage	2,277.36	0.08	0.03
Mobile Sources[1]	1,520.86	--	--
Net Reduction	*(1,949.62)*	--	--
Total CO_2E (All Sources)		**7,963.27**	
Threshold		**10,000**	
Significant?		**NO**	

Source: See Appendix "A" for detailed calculations.
NG = Negligible
[1] EMFAC 2011 provides only CO2 emissions output

3.5 GREENHOUSE GAS EMISSIONS FINDINGS AND RECOMMENDATIONS

Results of the analysis indicate that the Project will not exceed the applicable threshold of 10,000 metric tons CO2 (or equivalent) and therefore a less than significant impact will occur.

Based on the 1996 EIR assumptions, the Project would result in 6,051.64 metric tons CO2 (or equivalent) which is less than the 10,000 metric ton CO2 (or equivalent) threshold and a less than significant impact would occur.

Based on the proposed MUP Update, the Project would result in 7,963.27 metric tons CO2 (or equivalent) which is less than the 10,000 metric ton CO2 (or equivalent) threshold and a less than significant impact would occur.

4.0 REFERENCES

1. California Agricultural Experiment Station, 2005. *Working Paper No. 994 A Note On The Environmental Costs of Aggregates by Peter Berck.*

2. California Air Resources Board, 2007. *California Air Resources Board Almanac.*

3. California Air Resources Board, 2011. *EMFAC 2011.*

4. California Air Resources Board, 2010. *California Greenhouse Gas 2000-2008 Inventory by Scoping Plan Category - Summary.*

5. California Building Standards Commission, 2010. 2008 *California Green Building Standards Code.*

6. California Energy Commission, 2005. *Inventory of California Greenhouse Gas Emissions and Sinks.*

7. International Panel on Climate Change, 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report.*

8. SANDAG, 2010. *San Diego Region Aggregate Supply Study.*

9. South Coast Air Quality Management District (SCAQMD), 1993. *CEQA Air Quality Handbook.*

10. United States Department of Labor, 2011. *Occupational Safety and Health Guideline for Nitrous Oxide.*

11. United States Environmental Protection Agency, 2011. *Inventory of US Greenhouse Gas Emissions and Sinks 1990-2011.*

12. United States Environmental Protection Agency, 2010. *High Global Warming Potential (GWP) Gases.*

13. Urban Crossroads, Inc., 2011. *Rosemary Mountain Quarry MUP Update – Trip Generation.*

14. World Resources Institute, 2011. *Climate Analysis Indicator Tool (CAIT) – US – Yearly Emissions Inventory.*

APPENDIX A

GHG Emissions Calculations

4.0 REFERENCES

1. California Agricultural Experiment Station, 2005. *Working Paper No. 994 A Note On The Environmental Costs of Aggregates by Peter Berck.*

~~1.~~2. California Air Resources Board, 2007. *California Air Resources Board Almanac.*

~~2.~~3. California Air Resources Board, 2011. *EMFAC 2011.*

~~3.~~4. California Air Resources Board, 2010. *California Greenhouse Gas 2000-2008 Inventory by Scoping Plan Category - Summary.*

~~4.~~5. California Building Standards Commission, 2010. 2008 *California Green Building Standards Code.*

~~5.~~6. California Energy Commission, 2005. *Inventory of California Greenhouse Gas Emissions and Sinks.*

7. International Panel on Climate Change, 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report.*

8. SANDAG, 2010. *San Diego Region Aggregate Supply Study.*

~~6.~~9. South Coast Air Quality Management District (SCAQMD), 1993. *CEQA Air Quality Handbook.*

~~7.~~10. United States Department of Labor, 2011. *Occupational Safety and Health Guideline for Nitrous Oxide.*

~~8.~~11. United States Environmental Protection Agency, 2011. *Inventory of US Greenhouse Gas Emissions and Sinks 1990-2011.*

~~9.~~12. United States Environmental Protection Agency, 2010. *High Global Warming Potential (GWP) Gases.*

~~10.~~13. Urban Crossroads, Inc., 2011. *Rosemary Mountain Quarry MUP Update – Trip Generation.*

~~11.~~14. World Resources Institute, 2011. *Climate Analysis Indicator Tool (CAIT) – US – Yearly Emissions Inventory.*

APPENDIX A

GHG Emissions Calculations

Granite Construction Co. Rosemary's Mountain Pit

Calculations

	Description	HP	Count	Total HP
AGG Plant 500tph				
4000 amp main	Buildings	20	3	60
3000 trip	Air Compressor	50	4	200
	Water Pump	150	2	300
	Misc Lighting	80	1	80
1	Jaw Crusher 32 x 48 (from Indio)	250	1	250
2	Feeder 76 x24	100	1	100
Overland Conveyors	10 @ 25 HP each	25	10	250
Bench conveyors	4 30 hp	30	4	120
BC1	42"X45' DOZER TRAP DISCHARGE BELT	50	5	250
BC1A	42"X10' BELT FEEDER	25	1	25
BC2	48"X80' UNDERSCREEN CONVEYOR	20	1	20
BC4	36"X40' STACKABLE	10	1	10
BC5	36"X100 RADIAL STACKER	30	3	90
VS1	8 x 20 primary scalping SCREEN	50	1	50
BC6	36"X12' CROSS CONVEYOR	5	1	5
BC7	42"X50' SCREEN FEED CONVEYOR	40	1	40
MS1	48" MAGNETIC SEPERATOR	3	1	3
	5 KW RECTIFIER	7.5	1	7.5
CR1	GP300 CONE CRUSHER	300	1	300
	LUBRICATION PUMP	7.5	1	7.5
	HYDRAULIC PUMP	1	1	1
	FAN COOLER	3	1	3
	HO FAN COOLER	3	1	3
	DUSTSEAL FAN COOLER	0.5	1	0.5
CR2	HP500 TERTIARY CONE CRUSHER	500	1	500
	LUBRICATION PUMP	10	1	10
	FAN COOLER	7.5	1	7.5
	HYDRAULIC SYSTEM	10	1	10
	IMMERSION HEATER	15	1	15
BC13	36"X100' STACKABLE	30	1	30
VS2	6'X20' METSO FS SCREEN	50	1	50
BC19	48"X32' UNDERSCREEN CONVEYOR	10	1	10
BC20	48"X32' UNDERSCREEN CONVEYOR	10	1	10
BC21	36"X30' STACKABLE	10	1	10
BC30	36"X65' STACKABLE	20	1	20
BC31	36"X60'STACKABLE CONVEYOR	20	1	20
BC33	48"X30' UNDERSCREEN CONVEYOR	15	1	15
BC44	36"X10' BELT FEEDER	10	1	10
BC45	36"X30' STACKABLE	15	1	15
BC46	36"X100 RADIAL STACKER	40	1	40
	Dust Collectors--entire site (need on all crushers and screens)	50	8	400
	Upper AGG Plant switchgear HP total			**3348**
Lower AGG/Screening plant				
		HP	Count	Total HP
BC34	48"X30' UNDERSCREEN CONVEYOR	10	1	10
BC35	36"X30' STACKABLE	10	1	10
BC36	36"X50'STACKABLE CONVEYOR	10	1	10
BC37	36"X60'STACKABLE CONVEYOR	10	1	10
BC38	36"X60'STACKABLE CONVEYOR	15	1	15
BC39	36"X60'STACKABLE CONVEYOR	15	1	15
BC40	36"X60'STACKABLE CONVEYOR	15	1	15
BC41	36"X100 RADIAL STACKER	30	6	180
VS5	6'X20' DD FS SCREEN	50	2	100
VS6	6x20' PEP high freq screen	50	1	50
BC14	36"X5' BELT FEEDER	5	1	5
BC15	36"X5' BELT FEEDER	5	1	5
BC16	36"X100' STACKABLE	20	1	20
BC17	36"X100' STACKABLE	20	1	20
BC18	36"X100' STACKABLE	50	1	50
CR3	HP400 TERTIARY CONE CRUSHER	400	1	400
	LUBRICATION PUMP	10	1	10
	FAN COOLER	7.5	1	7.5
	HYDRAULIC SYSTEM	10	1	10
	IMMERSION HEATER	15	1	15

BC8	42"X60' UNDER CONE CONVEYOR	40	1	40	
BC9	36"X5' BELT FEEDER (tunnel under 1" minus)	5	4	20	
BC12	36"X60' STACKABLE	25	1	25	
BC22	36"X117' STACKABLE	30	1	30	
BC23	36"'X100' STACKABLE	20	1	20	
BC24	36"X30' STACKABLE	5	1	5	
BC26	36"X30' STACKABLE	15	1	15	
BC27	36"X8' BELT FEEDER	5	3	15	
BC29	36"X65' STACKABLE	20	1	20	
Dust collectors	3 50 hp	50	3	150	
	Lower AGG/Screening Plant switchgear HP total			**1298**	
		HP	Count	Total HP	
Asphalt Plant					
	CV-41	15	1	15	
	CV-43	40	1	40	
	CV-44	15	1	15	
	Single Screen	10	1	10	
	Elevator Conveyor	100	1	100	
	Slat Conveyor	75	1	75	
	Transfer Conveyors	30	2	60	
	Feeders (RAP) -- others in silo system	7.5	2	15	
	Drum Drives	50	4	200	
	Baghouse Conveyor	15	2	30	
	Recycle System	25	1	25	
	Slat Conveyor Clean out	75	1	75	
	3 Way transfer conveyor	75	1	75	
	Dust Auger	7.5	3	22.5	
	Scale Conveyor	15	1	15	
	Baghouse Fans	150	2	300	
	Blue Smoke System	10	1	10	
	Pumps	20	1	20	
	Air Compressor	40	1	40	
	Asphalt Plant HP Total			**1143**	
Aggregate Silos from Columbia Tech tank					
Description	Qty	**HP each**	**Qty**	**Total HP**	
Belt Feeders		5	14	70	
Transfer conveyors 36x100		15	2	30	
Loadout conveyors 36x205		40	2	80	
Air Compressor		50	1	50	
	Asphalt Plant HP Total			**230**	
Power Shovel					
Description			**Qty**	**Total KW**	
CAT 7295 ELECTRIC SHOVEL			1	2152	
	Power Shovel Peak Power			**2152**	
	RECAP	**HP**	**PEAK KW**	**AVG KW CONSUMED/HR**	
Upper Agg Plant switchgear		**3,348**	**2,123**	**1,274**	
Ashalt Plt & Lower AGG plt switchgear		**2,440**	**1,547**	**928**	
Agg SILO system		**230**	**146**	**88**	
Power Shovel			**2,152**	**600**	
	Total site power	**6,018**	**5,968**	**2,890**	

Calculations based on 1996 EIR

Production Year	1996
Total Agg	1.2 MMton/yr total Aggregate
Annual Production % of Max	100%
Aggregate	510,000
HMA	420,000
Concrete	270,000

ON-SITE EMISSIONS ONLY **Basis: 1.2 MMton/yr total Aggregate**

Facility Totals

DRAFT November 30, 2011 **Year: 1996**

Daily (lb/day)

	Greenhouse Gases		
Source Category	**CO2**	**CH4**	**N2O**
Hot Mix Asphalt Plant -Combustion	18,099	4.6	4.6
Facility Vehicles - On-Site Equipment	6,201	0.55	0
Electricity	20,308	0.754	0.29
Totals	**44,608**	**5.9**	**4.8**

Annual (TPY)

	Greenhouse Gases		
Source Category	**CO2**	**CH4**	**N2O**
Hot Mix Asphalt Plant	2,823	0.7	0.7
Facility Vehicles - Tailpipe	967	0.09	0
Electricity	3,168	0.12	0.04
Totals	**6,959**	**0.9**	**0.8**

Annual (MTPY)

	Greenhouse Gases		
Source Category	**CO2**	**CH4**	**N2O**
Hot Mix Asphalt Plant	2,561	0.6	0.6
Facility Vehicles - Tailpipe	878	0.08	0
Electricity	2,874.05	0.11	0.04
Totals	**6,313**	**0.8**	**0.7**

Totals CO2e	**6,543**

Rosemary Operations Data

Max Production Percentage 100%

Production Data

Activity	High Production		
	Annual (TPY)	Daily (TPD)	Hourly (TPH)
Total Aggregate Throughput[1]	510,000	1,635	163
Aggregate Production	510,000	1,635	163
Hot Mix Asphalt Plant	420,000	1,346	135
Concrete Plant	270,000	865	87

Table Notes:

Production Schedule

	Daily Schedule at High Production Rate (hrs/day)[1]	Annual Schedule at High Production (hrs/yr)
Aggregate Plant Schedule	10.0	3,120
Products Loading Schedule	10.0	3,120
Asphalt Plant Schedule	10.0	3,120
Concrete Plant Schedule	10.0	3,120

Aggregate Material Transfer Rates

Activity	Percent of Product as Aggregate (%)	Aggregate Transferred		Transfer Method
		Annual Production w/RAP (TPY)	Daily High Production w/RAP (TPD)	
Rock to Primary Plant	100	510,000	1,635	Conveyor
Aggregates to On-road Product Haul Truck	100	510,000	1,635	Conveyor
Aggregates to Asphalt Plant 1	100	420,000	1,346	Conveyor
Aggregates to Concrete Plant	100	270,000	865	Conveyor

Table Notes:

Haul Rates

Activity	Material Transferred			Method
	Annual (TPY)	Daily High Production (TPD)	Truck Capacity (Tons)	
Aggregate Product	510,000	1,635	25	Truck
Asphalt Product	420,000	1,346	25	Truck
Concrete Product	270,000	865	20	Truck

Hot Mix Asphalt Plant 1- Utilizing RAP

Hot Mix Drum Burner:

370	MMBtu/day
115,500	MMBtu/year
275,000	Btu/ton

High Production:

135	TPH asphalt (Aggregate + RAP + Oil)
1,346	TPD asphalt (Aggregate + RAP + Oil)
420,000	TPY asphalt (Aggregate + RAP + Oil)
5	% Oil in asphalt product
15	% RAP in asphalt product
107.6923077	TPH aggregate w/o RAP
1,077	TPD aggregate w/o RAP
336,000	TPY aggregate w/o RAP
10.0	hrs/day

PRODUCTION

		Hourly		Daily		Annual	
Equipment Category	**Description**	(TPH)	(MMBtu/hr)	(TPD)	(MMBtu/day)	(TPY)	(MMBtu/yr)
Hot Mix Asphalt Plant	Dryer Burner/Baghouse	135	37	1,346	370	420,000	115,500
Hot Oil Heater	Hot Oil Heater		5		50		15,600

EMISSION FACTORS

Equipment Category	**Description**	**CO2**	**CH4**	**N2O**	**Units**
Hot Mix Asphalt Plant	Dryer Burner/Baghouse[1]	33	0.012	0.012	lb/MMBtu
Hot Oil Heater	Hot Oil Heater[2]	117.65	2.25E-03	2.16E-03	lb/MMBtu

1. Greenhouse gas (CO2, CH4, and N2O) emission factors from US EPA AP42 11.1, Tables 11.1-7 and 11.1-8
2. Greenhouse gas (CO2, CH4, and N2O) emission factors from AP-42, Section 1.4, dated July 1998.

HOURLY EMISSIONS

Equipment Category	**Description**	**CO2** (lb/hr)	**CH4** (lb/hr)	**N2O** (lb/hr)	
Hot Mix Asphalt Plant	Dryer Burner/Baghouse	1221.635	0.44	0.44	
Hot Oil Heater	Hot Oil Heater	588.24	0.011	0.011	
Total		1,810	0.5	0.5	

DAILY EMISSIONS

Equipment Category	**Description**	**CO2** (lb/day)	**CH4** (lb/day)	**N2O** (lb/day)	
Hot Mix Asphalt Plant	Dryer Burner/Baghouse	12,216	4.4	4.4	
Hot Oil Heater	Hot Oil Heater	5,882	0.11	0.11	
Total		18,099	4.6	4.6	

ANNUAL EMISSIONS

Equipment Category	**Description**	**CO2** (TPY)	**CH4** (TPY)	**N2O** (TPY)	
Hot Mix Asphalt Plant	Dryer Burner/Baghouse	1,906	0.7	0.7	
Hot Oil Heater	Hot Oil Heater	918	0.018	0.017	
Total		2,823	0.7	0.7	

GREENHOUSE GAS EMISSIONS RESULTING FROM ELECTRICITY USE

Input			6,430,320	Annual Energy Usage (kWh)[1]
Output	2,510.36	CO2 Emissions (tpy)	0.78079	CO2 produced per kWh (lbs)[2]
	0.04	N2O Emissions (tpy)	0.000011	N2O produced per kWh (lbs)[2]
	0.09	CH4 Emissions (tpy)	0.000029	CH4 produced per kWh (lbs)[2]

1Source: Project Applicant, 2,290 kWh to power Site per day x 312 working-days x 9 hours

2Source: Based on 2006 emission factors listed in Local Government Operations Protocol. Methane and Nitrous Oxide based on E-Grid values for California.

GREENHOUSE GAS EMISSIONS RESULTING FROM ELECTRICITY USE

Input			1,684,800	Annual Energy Usage (kWh)[1]
Output	657.74	CO2 Emissions (tpy)	0.78079	CO2 produced per kWh (lbs)[2]
	0.01	N2O Emissions (tpy)	0.000011	N2O produced per kWh (lbs)[2]
	0.02	CH4 Emissions (tpy)	0.000029	CH4 produced per kWh (lbs)[2]

1Source: Project Applicant, Electric Shovel operating 9 hrs/day/312 days, Peak demand 600 kWh (CAT 7295, Electic Rope Shovel) assumed 80% load factor

2Source: Based on 2006 emission factors listed in Local Government Operations Protocol. Methane and Nitrous Oxide based on E-Grid values for California.

Onsite Vehicles and Heavy Duty Diesel Equipment

Diesel Operated Equipment Activity

ID	Source	Horsepower (hp)	Load Factor [1]	Output (hp)	Operating Schedule	
		HP			hrs/day	hrs/year
DE	Drilling Equipment	300	0.62	186	10.0	3120
PJC	Portable Jaw Crusher	500	0.62	310	10.0	3120

1. Table A9-8-D, Typical Load Factors for Mobile (Off-Road) Equipment (Other), SCAQMD CEQA Air Quality Handbook.

Diesel Engine Emission Factors

Off-road Diesel Engine Standards (g/bhp-hr)[1]

Horsepower (hp)	Year	CO2 (g/hp-hr)	CH4 (g/hp-hr)	N2O (g/hp-hr)
174-751	2020	568.30	0.05	0.00
>751	2020	568.30	0.05	0.00

Notes:

1. Table 3.4 OFFROAD Equipment Emission Factors (CalEEMod Appendix D)

Daily Emissions

ID	Source	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)				
DE	Drilling Equipment	2325.48	0.20	0.00				
PJC	Portable Jaw Crusher	3875.80	0.34	0.00				
	Total	**6201.28**	**0.55**	**0.00**				

Annual Emissions

ID	Source	CO2 (TPY)	CH4 (TPY)	N2O (TPY)				
DE	Drilling Equipment	362.77	0.03	0.00				
PJC	Portable Jaw Crusher	604.62	0.05	0.00				
	Total	**967.40**	**0.09**	**0.00**				

Calculations for Proposed MUP Modification

Production Year	2020
Total Agg	1.2 MMton/yr total Aggregate
Annual Production % of Max	100%
Aggregate	510,000
HMA	420,000
Concrete	270,000

ON-SITE EMISSIONS ONLY **Basis: 1.2 MMton/yr total Aggregate**

Facility Totals

DRAFT November 30, 2011 **Year: 2020**

Daily (lb/day)

	Greenhouse Gases		
Source Category	**CO2**	**CH4**	**N2O**
Hot Mix Asphalt Plant -Combustion	18,099	4.6	4.6
Facility Vehicles - On-Site Equipment	19,409	1.71	0
Electricity	16,092	0.60	0.23
Totals	**53,600**	**6.9**	**4.8**

Annual (TPY)

	Greenhouse Gases		
Source Category	**CO2**	**CH4**	**N2O**
Hot Mix Asphalt Plant 1	2,823	0.7	0.7
Facility Vehicles - Tailpipe	3,679	0.32	0
Electricity	2,510	0.09	0
Totals	**9,013**	**1.1**	**0.7**

Annual (MTPY)

	Greenhouse Gases		
Source Category	**CO2**	**CH4**	**N2O**
Hot Mix Asphalt Plant 1	2,561	0.6	0.6
Facility Vehicles - Tailpipe	3,338	0.29	0
Electricity	2,277.36	0.08	0.03
Totals	**8,176**	**1.0**	**0.7**

Totals CO2e	**8,407**

Rosemary Operations Data

Max Production Percentage 100%

Production Data

Activity	High Production		
	Annual (TPY)	Daily (TPD)	Hourly (TPH)
Total Aggregate Throughput[1]	510,000	1,635	163
Aggregate Production	510,000	1,635	163
Hot Mix Asphalt Plant 1	420,000	1,346	135
Concrete Plant	270,000	865	87

Table Notes:

Production Schedule

	Daily Schedule at High Production Rate (hrs/day)[1]	Annual Schedule at High Production (hrs/yr)
Aggregate Plant Schedule	10.0	3,120
Products Loading Schedule	10.0	3,120
Asphalt Plant Schedule	10.0	3,120
Concrete Plant Schedule	10.0	3,120

Aggregate Material Transfer Rates

Activity	Percent of Product as Aggregate (%)	Aggregate Transferred		Transfer Method
		Annual Production (TPY)	Daily High Production w/RAP (TPD)	
Rock to Primary Plant	100	510,000	1,635	Traditional Equipment
Aggregates to On-road Product Haul Truck[1]	100	510,000	1,635	Traditional Equipment
Aggregates to Asphalt Plant 1[2]	100	420,000	1,346	Traditional Equipment
Aggregates to Concrete Plant[2]	100	270,000	865	Traditional Equipment

Table Notes:

Haul Rates

Activity	Material Transferred			Method
	Annual (TPY)	Daily High Production (TPD)	Truck Capacity (Tons)	
Aggregate Product	510,000	1,635	25	Truck
Asphalt Product	420,000	1,346	25	Truck
Concrete Product	270,000	865	20	Truck

Hot Mix Asphalt Plant 1- Utilizing RAP

Hot Mix Drum Burner:

370	MMBtu/day
115,500	MMBtu/year
275,000	Btu/ton

High Production:

135	TPH asphalt (Aggregate + RAP + Oil)
1,346	TPD asphalt (Aggregate + RAP + Oil)
420,000	TPY asphalt (Aggregate + RAP + Oil)
5	% Oil in asphalt product
15	% RAP in asphalt product
107.6923077	TPH aggregate w/o RAP
1,077	TPD aggregate w/o RAP
336,000	TPY aggregate w/o RAP
10.0	hrs/day

PRODUCTION

		Hourly		Daily		Annual	
Equipment Category	**Description**	(TPH)	(MMBtu/hr)	(TPD)	(MMBtu/day)	(TPY)	(MMBtu/yr)
Hot Mix Asphalt Plant 1	Dryer Burner/Baghouse	135	37	1,346	370	420,000	115,500
Hot Oil Heater	Hot Oil Heater		5		50		15,600

EMISSION FACTORS

Equipment Category	**Description**	**CO2**	**CH4**	**N2O**	**Units**
Hot Mix Asphalt Plant 1	Dryer Burner/Baghouse[1]	33	0.012	0.012	lb/MMBtu
Hot Oil Heater	Hot Oil Heater[2]	117.65	2.25E-03	2.16E-03	lb/MMBtu

1. Greenhouse gas (CO2, CH4, and N2O) emission factors from US EPA AP42 11.1, Tables 11.1-7 and 11.1-8
2. Greenhouse gas (CO2, CH4, and N2O) emission factors from AP-42, Section 1.4, dated July 1998.

HOURLY EMISSIONS

Equipment Category	**Description**	**CO2** (lb/hr)	**CH4** (lb/hr)	**N2O** (lb/hr)	
Hot Mix Asphalt Plant 1	Dryer Burner/Baghouse	1221.635	0.44	0.44	
Hot Oil Heater	Hot Oil Heater	588.24	0.011	0.011	
Total		1,810	0.5	0.5	

DAILY EMISSIONS

Equipment Category	**Description**	**CO2** (lb/day)	**CH4** (lb/day)	**N2O** (lb/day)	
Hot Mix Asphalt Plant 1	Dryer Burner/Baghouse	12,216	4.4	4.4	
Hot Oil Heater	Hot Oil Heater	5,882	0.11	0.11	
Total		18,099	4.6	4.6	

ANNUAL EMISSIONS

Equipment Category	**Description**	**CO2** (TPY)	**CH4** (TPY)	**N2O** (TPY)	
Hot Mix Asphalt Plant 1	Dryer Burner/Baghouse	1,906	0.7	0.7	
Hot Oil Heater	Hot Oil Heater	918	0.018	0.017	
Total		**2,823**	**0.7**	**0.7**	

Onsite Vehicles and Heavy Duty Diesel Equipment

Diesel Operated Equipment Activity

ID	Source	Horsepower (hp)	Load Factor [1]	Output (hp)	Operating Schedule	
		HP			hrs/day	hrs/year
EX	CAT 385 B Excavator	575	0.57	327.75	10.0	3120
RFRT1	CAT 773F Ridge Frame Rock Truck 1	800	0.57	456	10.0	3120
RFRT2	CAT 773F Ridge Frame Rock Truck 2	800	0.57	456	10.0	3120
LDR	CAT 980H Loader	500	0.54	270	4.0	1248
WW	CAT 613 C Water Wagon	187	0.57	106.59	4.0	1248
DR1	Drill Rig	300	0.62	186	10.0	3120
PJC	Portable Jaw Crusher	500	0.62	310	10.0	3120

1. Table A9-8-D, Typical Load Factors for Mobile (Off-Road) Equipment, SCAQMD CEQA Air Quality Handbook.

Diesel Engine Emission Factors

Off-road Diesel Engine Standards (g/bhp-hr)[1]

Horsepower (hp)	Year	CO2 (g/hp-hr)	CH4 (g/hp-hr)	N2O (g/hp-hr)
174-751	2020	568.30	0.05	0.00
>751	2020	568.30	0.05	0.00

Notes:

1. Table 3.4 OFFROAD Equipment Emission Factors (CalEEMod Appendix D)

Daily Emissions

ID	Source	CO2 (lb/day)	CH4 (lb/day)	N2O (lb/day)				
EX	CAT 385 B Excavator	4097.72	0.36	0.00				
RFRT1	CAT 773F Ridge Frame Rock Truck 1	5701.18	0.50	0.00				
RFRT2	CAT 773F Ridge Frame Rock Truck 2	5701.18	0.50	0.00				
LDR	CAT 980H Loader	3375.70	0.30	0.00				
WW	CAT 613 C Water Wagon	533.06	0.05	0.00				
LDR	CAT 980H Loader	2325.48	0.20	0.00				
WW	CAT 613 C Water Wagon	3875.80	0.34	0.00				
	Total	**19408.83**	**1.71**	**0.00**				

Annual Emissions

ID	Source	CO2 (TPY)	CH4 (TPY)	N2O (TPY)				
EX	CAT 385 B Excavator	639.24	0.06	0.00				
RFRT1	CAT 773F Ridge Frame Rock Truck 1	889.38	0.08	0.00				
RFRT2	CAT 773F Ridge Frame Rock Truck 2	889.38	0.08	0.00				
LDR	CAT 980H Loader	210.64	0.02	0.00				
WW	CAT 613 C Water Wagon	83.16	0.01	0.00				
LDR	CAT 980H Loader	362.77	0.03	0.00				
WW	CAT 613 C Water Wagon	604.62	0.05	0.00				
	Total	**3679.21**	**0.32**	**0.00**				

GREENHOUSE GAS EMISSIONS RESULTING FROM ELECTRICITY USE

Input			6,430,320	Annual Energy Usage (kWh)[1]
Output	2,510.36	CO2 Emissions (tpy)	0.78079	CO2 produced per kWh (lbs)[2]
	0.04	N2O Emissions (tpy)	0.000011	N2O produced per kWh (lbs)[2]
	0.09	CH4 Emissions (tpy)	0.000029	CH4 produced per kWh (lbs)[2]

1Source: Project Applicant, 2,290 kWh to power Site per day x 312 working-days x 9 hours

2Source: Based on 2006 emission factors listed in Local Government Operations Protocol. Methane and Nitrous Oxide based on E-Grid values for California.

Mobile Source Emissions

Facility	Hwy 76 from Mission Rd. to I-15	Hwy 76 and I-15 Interchange	Toll Lanes North from Escondido to County Line	Meadow Wood Residential	Palomar Extension Campus	Camp Pendelton	El Corazon Oceanside	Avg. Distance	Sum of distances w/in 25 mi	number of suppliers w/in 25 mi	production
Rosemary's Mountain	5	2	5	2	3	21	17	7.86	55	13	Both
Harmony Grove Aggregates	24	20	24	22	23	24	20	22.43	157	13	Aggregates
Inland Valley Quarry	25	22	26	24	24.9	28	24	24.84	119.9	11	Both
Escondido Asphalt	20	16.5	20	18	20	23	19	19.50	136.5	13	Asphalt
Superior Ready Mix Oceanside	12	16	20	18	18	8	1	13.29	93	13	Concerete
Superior Ready Mix Escondido	20	16.5	20	18	20	23	19	19.50	136.5	13	Concerete
Superior Ready Mix Fallbrook	7	11	15	9	8	15	17	11.71	82	13	Concerete
National Quarries (Wyrock)	20	16	20	18	19.5	22.5	19	19.29	135	13	Aggregates
Palomar Tranit Mix Escondido	20	16.5	20	18	20	23	19	19.50	136.5	13	Concerete
Palomar Tranit Mix Oceanside	13	17	21	19	19	9	2	14.29	100	13	Concerete
Hanson Oceanside	13	17	21	19	19	9	2	14.29	100	13	Concerete
Hanson Escondido	20	16.5	20	18	20	23	19	19.50	136.5	13	Concerete
Cemex	18	14	19	13.5	12	34	29	19.93	76.5	11	Concerete
								Rosemary's Mountain	**55**	**13**	**4.23076923**
								asphalt producers	**256.4**	**24**	**10.6833333**
								concrete producers	**1115.9**	**113**	**9.87522124**
								aggregate	**292**	**26**	**11.2307692**

VMT/Truck Trip	
Rosemary's Mountain	**15.71**
Other (Asphalt)	**21.37**
Other (Concrete)	**19.75**
Other (Aggregate)	**22.46**

Rosemary's Mountain

EMFAC 2011
2020 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Diego COUNTY
San Diego AIR BASIN
San Diego County APCD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	Pop (Vehicles)	VMT (Miles/day)	Trips (Trips/day)	CO2_RUNEX (gms/mile)	CO2_RUNEX(Pavley I+LCFS) (gms/mile)
San Diego (SD)	2020	Annual	LDA	GAS	AllMYr	AllSpeeds	1261438.2	4.64E+07	7971038.9	355.3192159	244.1592557
San Diego (SD)	2020	Annual	LDT1	DSL	AllMYr	AllSpeeds	225.9647	8186.9883	1307.8434	382.0140121	259.4242571
San Diego (SD)	2020	Annual	T6 instate construction heavy	DSL	AllMYr	AllSpeeds	785.66166	42413.789	0	1191.479603	1072.331643

Without Pavley I + LCFS

	Trips	Trip Length (Round Trip)	Emissions (grams/day)	Emissions (lbs/day)	Emissions (metric tons/yr)
Sand Import	17	40	810206.1302	1786.208096	252.7856334
Ready-Mix	68	15.71	1272833.831	2806.132919	397.1262301
Aggregate	141	15.71	2639258.384	5818.59914	823.4529183
Employee	62	40	914293.2027	2015.68201	285.2609697
Total	**288**		**5636591.547**	**12426.62216**	**1,758.63**

With Pavley I + LCFS

	Trips	Trip Length (Round Trip)	Emissions (grams/day)	Emissions (lbs/day)	Emissions (metric tons/yr)
Sand Import	17	40	729185.5172	1607.587286	227.5070701
Ready-Mix	68	15.71	1145550.447	2525.519627	357.4136071
Aggregate	141	15.71	2375332.546	5236.739226	741.1076265
Employee	62	40	624443.5558	1376.669582	194.8274074
Total	**288**		**4874512.066**	**10746.51572**	**1,520.86**

Other Facilities

EMFAC 2011
2020 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Diego COUNTY
San Diego AIR BASIN
San Diego County APCD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	Pop (Vehicles)	VMT (Miles/day)	Trips (Trips/day)	CO2_RUNEX (gms/mile)	CO2_RUNEX(Pavley I+LCFS) (gms/mile)
San Diego (SD)	2020	Annual	LDA	GAS	AllMYr	AllSpeeds	1261438.2	4.64E+07	7971038.9	355.3192159	244.1592557
San Diego (SD)	2020	Annual	LDT1	DSL	AllMYr	AllSpeeds	225.9647	8186.9883	1307.8434	382.0140121	259.4242571
San Diego (SD)	2020	Annual	T6 instate construction heavy	DSL	AllMYr	AllSpeeds	785.66166	42413.789	0	1191.479603	1072.331643

Without Pavley I + LCFS

	Trips	Trip Length (Round Trip)	Emissions (grams/day)	Emissions (lbs/day)	Emissions (metric tons/yr)
Sand Import	17	40	810206.1302	1786.208096	252.7856334
Ready-Mix	68	20.56	1665783.804	3672.443845	519.7272623
Aggregate	141	22.46	3773249.096	8318.63378	1177.259869
Employee	62	40	914293.2027	2015.68201	285.2609697
Total	**288**		**7163532.233**	**15792.96773**	**2,235.03**

With Pavley I + LCFS

	Trips	Trip Length (Round Trip)	Emissions (grams/day)	Emissions (lbs/day)	Emissions (metric tons/yr)
Sand Import	17	40	729185.5172	1607.587286	227.5070701
Ready-Mix	68	20.56	1499205.423	3305.199461	467.7545361
Aggregate	141	22.46	3395924.187	7486.770402	1059.533882
Employee	62	40	624443.5558	1376.669582	194.8274074
Total	**288**		**6248758.683**	**13776.22673**	**1,949.62**