Amendment No. 2 to Reclamation Plan 2006-01

GREENHOUSE GAS ANALYSIS

CITY OF LAKE ELSINORE

PREPARED BY:

Haseeb Qureshi
hqureshi@urbanxroads.com
(949) 336-5987

JULY 14, 2016

TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
CAA	Federal Clean Air Act
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CAT	Climate Action Team
CBSC	California Building Standards Commission
CEC	California Energy Commission
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
CH4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
EPA	Environmental Protection Agency
EPS	Emission Performance Standard
GCC	Global Climate Change
GHGA	Greenhouse Gas Analysis
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
LCA	Life-Cycle Analysis
MMs	Mitigation Measures
$MMTCO_2e$	Million Metric Ton of Carbon Dioxide Equivalent
$MTCO_2e$	Metric Ton of Carbon Dioxide Equivalent
N20	Nitrogen Dioxide
NIOSH	National Institute for Occupational Safety and Health
NOx	Oxides of Nitrogen
PFC	Perfluorocarbons
PM10	Particulate Matter 10 microns in diameter or less
PM2.5	Particulate Matter 2.5 microns in diameter or less
PPM	Parts Per Million
Project	Amendment No. 2 to Reclamation Plan 2006-01

RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
UNFCCC	United Nations' Framework Convention on Climate Change
VOC	Volatile Organic Compounds

This page intentionally left blank

EXECUTIVE SUMMARY

SUMMARY OF FINDINGS

The Project will result in approximately 9,836.53 metric tons of carbon dioxide equivalents (MTCO2e) per year; the proposed project would not exceed the SCAQMD's threshold of 10,000 MTCO2e per year. Therefore, a less than significant impact will occur.

Results of the analysis indicate that the Project GHG emissions would not result in or cause a potentially significant impact on the environment. To this end, the analysis demonstrates that the Project is consistent with, or otherwise not in conflict with, recommended measures and actions in the California Air Resources Board (CARB) December 2008 Scoping Plan (CARB Scoping Plan). The CARB Scoping Plan establishes strategies and measures to implement in order to achieve the GHG reductions goals set forth in the Global Warming Solutions Act of 2006 (AB 32).

TABLE ES-1: NET NEW PROJECT GREENHOUSE GAS EMISSIONS

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Operational Equipment	432.49	0.13	--	435.24
Electricity from Aggregate Process	92.4	--	--	92.4
Mobile Sources	1,844.56	0.01	--	1,844.84
Asphalt Batch Plant	7,464.05	--	--	7,464.05
Total CO_2E (All Sources)	9,836.53			
SCAQMD Threshold	**10,000**			
Threshold Exceeded?	**NO**			

Source: CalEEMod™ model output, See Appendix 3.1 for detailed model outputs.
Note: Totals obtained from CalEEMod™ and may not total 100% due to rounding.

Table results include scientific notation. *e* is used to represent *times ten raised to the power of* (which would be written as x 10^{b}") and is followed by the value of the exponent

1 INTRODUCTION

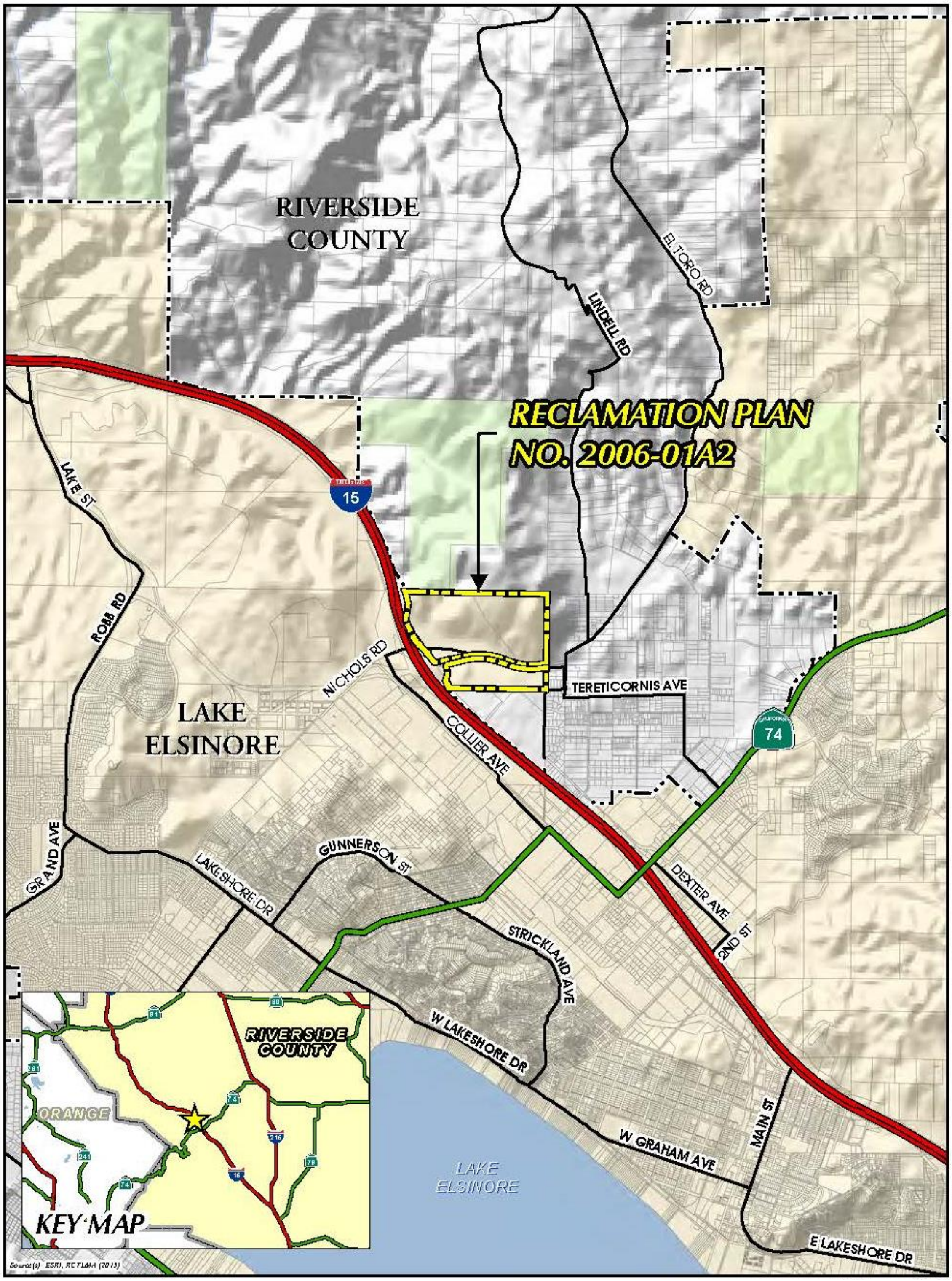
This report presents the results of the greenhouse gas analysis (GHG) for the proposed Amendment No. 2 to Reclamation Plan 2006-01 (referred to as "Project") located north and south of Nichols Road and east of the I-15 Freeway in the City of Lake Elsinore as shown on Exhibit 1-A.

1.1 PROJECT OVERVIEW

The historic tonnage average is 556,348 tons per year (TPY). Although proposed RP 2006-01A2 would reduce the allowed maximum total annual tonnage material from 4,000,000 tpy to 856,560 tpy, historical data recorded by the mine operator indicates that the mine produced an average of approximately 556,348 tpy between 2007 and 2014 (herein, "historic baseline").

The Project is proposing a permit that would allow up to 856,560 TPY, which is a reduction to the originally permitted 4,000,000 TPY for the site. However, because the Project's proposed annual tonnage cap (856,560 TPY) is greater than the historic baseline average (556,348 TPY), the Project would result in a net increase of 300,212 TPY as compared to the historic baseline, representing an increase of 35.1%. Impact calculations herein that rely on annual tonnage account the net increase over the historic baseline (e.g., 300,212 TPY). The Project Applicant also estimates that a reasonable high-end estimate of daily tonnage at the site is approximately 5,000 tons per day (TPD). Because the Project represents 35.1% of the total annual tonnage cap, it is also reasonable to assume that approximately 1,752 TPD (35.1% of 5,000 TPD) would be attributable to the Project. In addition, the Project also proposes to modify the existing mining operations from 7:00 AM to 12:00 AM (Mondays through Fridays, excluding Federal Holidays) and between 7:00 AM to 7:00 PM (Saturdays only) to between 4:00 AM and 12:00 AM (Mondays through Saturdays, excluding Federal Holidays) for mining equipment and asphalt batch plant operation and 24 hours per day (Mondays through Saturdays, excluding Federal Holidays) for aggregate and asphalt batch plant export activities. The proposed changes to the Mine's operating hours also would apply to the asphalt batch plant. For purposes of this air quality impact analysis it is anticipated that the Project will be fully operational by Year 2016 (i.e., opening year). As indicated on Exhibit 1-A, access to the Project site is currently and will continue to be provided to Nichols Road via 2 existing driveways. Regional access to the Project site is provided via the I-15 Freeway at Nichols Road interchange. The Nichols North site is also subject to approved Conditional Use Permit (CUP 2014-07) which allows for the operation of a portable asphalt batch plant on approximately 1.76 acres of the Project site. Although the asphalt batch plant is previously approved, entitled, and permitted, the analysis in this GHGA conservatively assumes 100% of the impacts from the asphalt batch plant.

EXHIBIT 1-A: LOCATION MAP



Source: T&B Planning

This page intentionally left blank

2 CLIMATE CHANGE SETTING

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 2012. For the Year 2012 the sum of these emissions totaled approximately 28,865,994 gigagrams (Gg) CO2e[1] (1) (2). 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.

[1] 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,"

United States

As noted in Table 2-1, the United States, as a single country, was the number two producer of GHG emissions in 2012. 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.

TABLE 2-1: TOP GHG PRODUCER COUNTRIES AND THE EUROPEAN UNION [2]

Emitting Countries	GHG Emissions (Gg CO2e)
China	10,975,500
United States	6,665,700
European Union (28 member countries)	4,544,224
Russian Federation	2,322,220
India	3,013,770
Japan	1,344,580
Total	**28,865,994**

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 inventory, California emitted 474 MMTCO2e including emissions resulting from imported electrical power in 2008 (4). Based on the CARB inventory data and GHG inventories compiled by the World Resources Institute (5), 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 (6).

[2] Used http://unfccc.int data for Annex I countries. Consulted the CAIT Climate Data Explorer in http://www.wri.org site to reference Non-Annex I countries such as China and India.

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 (CO_2e) greenhouse gas emissions. Despite a population increase of 16 percent between 1990 and 2004, California has 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 (5).

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 at Table 2-2. As shown in the table below, GWP range from 1 for carbon dioxide to 23,900 for sulfur hexafluoride. It should be noted that CARB is beginning to transition to the use of GWPs from IPCC's Fourth Assessment Report.

TABLE 2-2: GLOBAL WARMING POTENTIAL 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	25
Nitrous Oxide	120	298
HFC-23	264	14,800
HFC-134a	14.6	1,430
HFC-152a	1.5	124
Sulfur Hexafluoride (SF6)	3,200	22,800
Source: Environmental Protection Agency (EPA) 2013		

(URL: http://www.epa.gov/ghgreporting/documents/pdf/2013/documents/2013-data-elements.pdf)

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). 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 (7).

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, CO2 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 (8).

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.

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) (9).

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). 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 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 (C2H6) 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 (CHF3), HFC-134a (CF3CH2F), and HFC-152a (CH3CHF2). 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 (10). 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 (CF4) and hexafluoroethane (C2F6). The U.S. EPA estimates that concentrations of CF4 in the atmosphere are over 70 ppt.

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. 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

Public Health

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 impossible 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 up to 55 percent 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 (11). Exhibit 2-A presents the potential impacts of global warming.

<u>Water Vapor</u>: 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 (12).

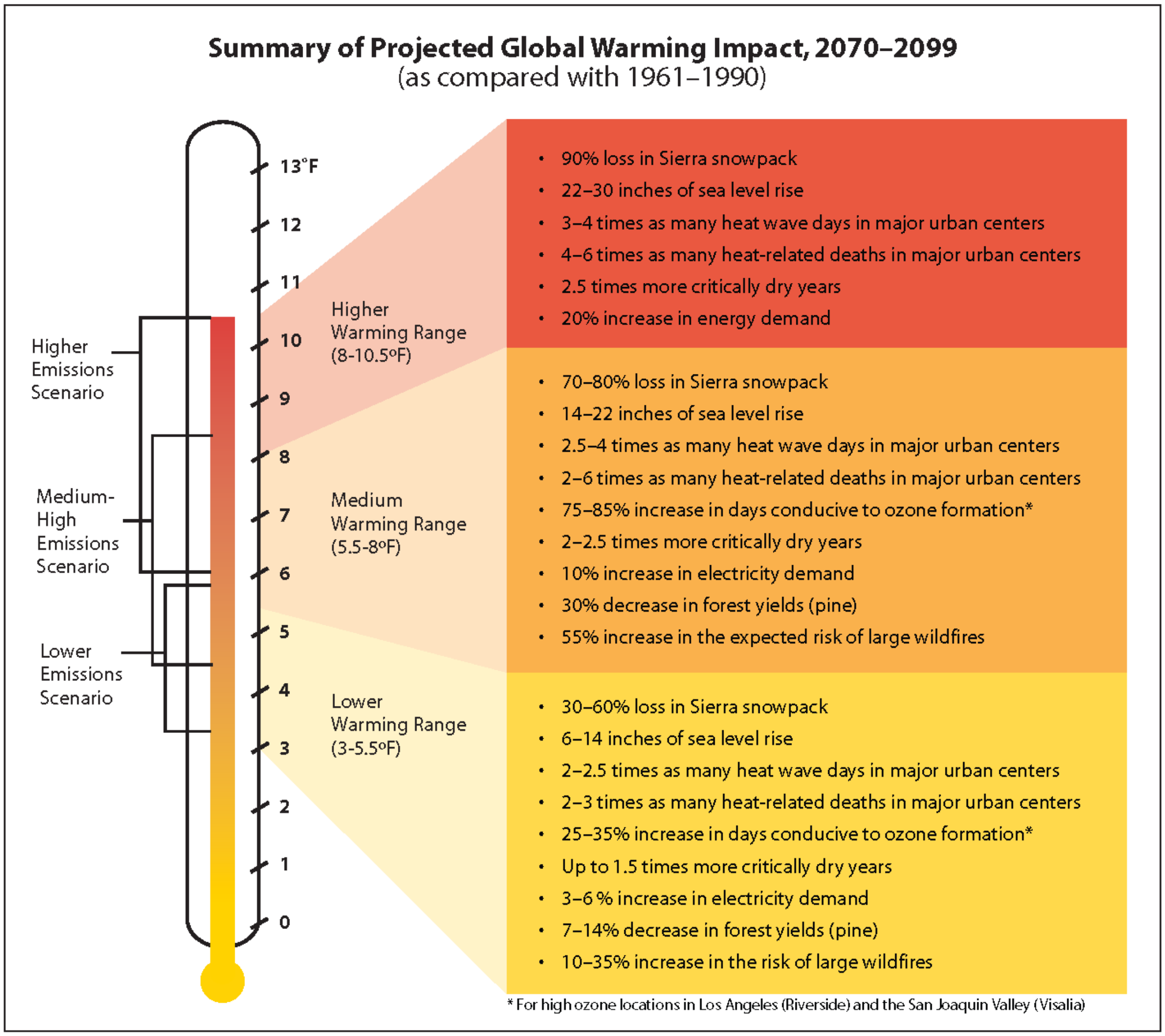
Specific health effects associated with directly emitted GHG emissions are as follows:

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 (13).

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 (13).

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 (12).

EXHIBIT 2-A: SUMMARY OF PROJECTED GLOBAL WARMING IMPACT



<u>Aerosols</u>: 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 (14).

2.7 REGULATORY SETTING

<u>International Regulation and the Kyoto Protocol:</u>

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 (15) 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 unintended 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 (16) 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 Energy Commission's most recent standard, 2013 Building Energy Efficiency Standard, is 25 percent more efficient than previous standards for residential construction and 30 percent better for nonresidential construction. The Standards, which took effect on January 1, 2014, offer builders better windows, insulation, lighting, ventilation systems and other features that reduce energy consumption in homes and businesses. Some improved measures in the Standards include:

Residential:

- Solar-ready roofs to allow homeowners to add solar photovoltaic panels at a future date
- More efficient windows to allow increased sunlight, while decreasing heat gain
- Insulated hot water pipes, to save water and energy and reduce the time it takes to deliver hot water
- Whole house fans to cool homes and attics with evening air reducing the need for air conditioning load
- Air conditioner installation verification to insure efficient operation

Nonresidential:

- High performance windows, sensors and controls that allow buildings to use "daylighting"
- Efficient process equipment in supermarkets, computer data centers, commercial kitchens, laboratories, and parking garages
- Advanced lighting controls to synchronize light levels with daylight and building occupancy, and provide demand response capability
- Solar-ready roofs to allow businesses to add solar photovoltaic panels at a future date
- Cool roof technologies

<u>CALGreen</u>

Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code) (17). 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.” 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. Unless otherwise noted in the regulation, all newly constructed buildings in California are subject of the requirements of the CALGreen Code.

CALGreen contains both mandatory and voluntary measures, for Non-Residential land uses there are 39 mandatory measures including, but not limited to: exterior light pollution reduction, wastewater reduction by 20%, and commissioning of projects over 10,000 sf. There are two tiers of voluntary measures for Non-Residential land uses for a total of 36 additional elective measures.

The 2013 CALGreen includes additions and amendments to the water efficiency standards for non residential buildings in order to comply with the reduced flow rate table. The 2013 CALGreen has also been rewritten to clarify and definitively identify the requirements and applicability for residential and nonresidential buildings.

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 (18). 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, CARB 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 CARB 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 CO_2 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.

<u>Executive Order S-3-05:</u>

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change (19). 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.

<u>California Assembly Bill 32 (AB 32):</u>

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 (20). 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). 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 28.4 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 plants, 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 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 CO_2e, 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 CO_2e (or approximately 1.2 percent of the GHG reduction target).

Overall, CARB determined that achieving the 1990 emission level in 2020 would require a reduction in GHG emissions of approximately 28.5 percent in the absence of new laws and

TABLE 2-3: SCOPING PLAN GHG REDUCTION MEASURES TOWARDS 2020 TARGET

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 MMT CO_2e	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 Targets[1]	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 Determined[2]	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 CO_2e: million metric tons of CO_2e
[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 CO_2e (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

regulations (referred to as "Business-As-Usual" [BAU]). The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and California Climate Action Team early actions and additional GHG reduction measures, identifies additional measures to be pursued as regulations, and outlines the role of the cap-and-trade program.

When the 2020 emissions level projection also was updated to account for implemented regulatory measures, including Pavley (vehicle model-years 2009 - 2016) and the renewable portfolio standard (12% - 20%), the 2020 projection in the BAU condition was reduced further to 507 $MTCO_2e$. As a result, based on the updated economic and regulatory data, CARB determined that achieving the 1990 emissions level in 2020 would now only require a reduction of GHG emissions of 80 $MTCO_2e$, or approximately 16 percent (down from 28.5 percent), from the BAU condition. (21) (22)

On February 10, 2014, CARB released a Draft Proposed First Update of the Scoping Plan. The draft recalculates 1990 GHG emissions using new global warming potentials identified in the IPCC Fourth Assessment Report released in 2007. Using those GWPs, the 427 $MTCO_2e$ 1990 emissions level and 2020 GHG emissions limit identified in the 2008 Scoping Plan would be slightly higher, at 431 $MTCO_2e$. (23) Based on the revised 2020 emissions level projection identified in the 2011 Final Supplement and the updated 1990 emissions levels identified in the discussion draft of the First Update, achieving the 1990 emissions level in 2020 would require a reduction of 78 $MTCO_2e$ (down from 509 $MTCO_2e$), or approximately 15.3 percent (down from 28.5 percent), from the BAU condition. (21) (22) (23)

Although CARB has released an update to the Scoping Plan and reduction targets from BAU, it is still appropriate to utilize the previous 28.5% reduction from BAU since the modeling tools available are not able to easily segregate the inclusion of the renewable portfolio standards, and Pavley requirements that are now included in the revised BAU scenario.

<u>California Senate Bill No. 1368 (SB 1368):</u>

In 2006, the State Legislature adopted Senate Bill 1368 ("SB 1368"), which was subsequently signed into law by the Governor (24). 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.

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 (25). 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."

Also amended were CEQA Guidelines Sections 15126.4 and 15130, which address mitigation measures and cumulative impacts respectively. Greenhouse gas mitigation measures are referenced in general terms, but no specific measures are championed. The revision to the cumulative impact discussion requirement (Section 15130) simply directs agencies to analyze greenhouse gas emissions in an EIR when a Project's incremental contribution of emissions may be cumulatively considerable, however it does not answer the question of when emission are cumulatively considerable.

Section 15183.5 permits programmatic greenhouse gas analysis and later project-specific tiering, as well as the preparation of Greenhouse Gas Reduction Plans. Compliance with such plans can support determination that a Project's cumulative effect is not cumulatively considerable, according to proposed Section 15183.5(b).

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:

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

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

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?

<u>Executive Order S-01-07:</u>

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 (26). The order also requires that a California specific Low Carbon Fuel Standard be established for transportation fuels.

<u>Senate Bills 1078 and 107 and Executive Order S-14-08:</u>

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 (27). SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010 (26). 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 (28).

<u>Senate Bill 375:</u>

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. CARB, 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. CARB 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."

The Southern California Association of Governments (SCAG) is required by law to update the Southern California Regional Transportation Plan (RTP) every four years. The 2012 draft plan has been released, this draft plan differs from past plans because it includes development of a SCS. The RTP/SCS incorporates land use and housing policies to meet the greenhouse gas emissions targets established by the California Air Resource Board (CARB) for 2020 (8% reduction) and 2035 (13% reduction). On April 4, 2012, the Regional Council of the Southern California Association of Governments (SCAG) adopted the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future.

Executive Order B-30-15:

On April 29, 2015 California Governor Jerry Brown, through Executive Order B-30-15 ("BEO") states a new statewide policy goal to reduce GHG emissions 40 percent below their 1990 levels by 2030.

The BEO sets an ambitious new Statewide GHG emissions reduction target of 40% below 1990 levels by 2030 as a "mid-term" benchmark needed to achieve the 80% below 1990 levels by 2020. It should be noted however that this target has not been formally enacted by the Legislature or even CARB. As such, the BEO does not appear to constitute a new regulation or requirement adopted to implement a statewide, regional or local plan for the reduction of GHG emissions within the context of CEQA.

Furthermore, the City of Lake Elsinore has an adopted CAP that governs specific GHG reduction targets for new development within the City. At this time, no further analysis is necessary or required by CEQA as it pertains to Executive Order B-30-15.

City of Lake Elsinore General Plan Sustainable Element:

The City of Lake Elsinore has created additional strategies within its General Plan to counter the adverse impacts of global warming and climate change. The following measures would reduce greenhouse gas emissions from all activities within the City boundaries to support the State's efforts under AB-32 and to mitigate the impact of climate change on the City, State, and world.

- **14.1** By 2020, the City will reduce greenhouse gas emissions from within its boundaries to 1990 levels consistent with AB 32.
- **14.2** Measures shall be established that aim to reduce emissions generated from City uses, community uses (community actions) and new development (City discretionary actions).
- **14.3** The City shall strive to increase public awareness of climate change and climate protection challenges.
- **14.4** The City will participate in the Sustainable Communities Strategy/Regional Blueprint Planning effort to ensure that local plans are consistent with the Regional Plan.

Additionally, the City has prepared and adopted a Climate Action Plan that provides a baseline greenhouse gas emissions inventory for municipal facilities and operations and community-wide activities and establishes measures to meet State-wide reduction goals.

<u>City of Lake Elsinore Climate Action Plan:</u>

The City of Lake Elsinore Climate Action Plan (CAP) is a comprehensive document to ensure that the City reduces community-wide GHG emissions consistent with AB 32 and Executive Order S-3-05 (29). The CAP was prepared concurrently with the City's General Plan and EIR, to serve as the City's primary information and policy document for GHG emissions reductions in order to analyze and reduce potentially significant GHG emissions resulting from development under the City of Lake Elsinore General Plan.

The CAP includes a "Project-Level CAP Consistency Worksheet" to determine if further analysis is required. It should be noted that the "Project-Level CAP Consistency Worksheet" is generally applicable to traditional land use development projects and does not apply to projects such as mining projects. As such, pursuant to the CAP documentation, further analysis is required to determine if a less than significant impact would occur. To that end, this analysis makes use of available numeric significance thresholds that have been adopted by other agencies in determining significance of GHG emissions.

<u>South Coast Air Quality Management District Recommendations for Significance Thresholds:</u>

In April 2008, the South Coast Air Quality Management District (SCAQMD), in order to provide guidance to local lead agencies on determining the significance of GHG emissions identified in CEQA documents, convened a "GHG CEQA Significance Threshold Working Group." The goal of the working group is to develop and reach consensus on an acceptable CEQA significance threshold for GHG emissions that would be utilized on an interim basis until CARB (or some other state agency) develops statewide guidance on assessing the significance of GHG emissions under CEQA.

Initially, SCAQMD staff presented the working group with a significance threshold that could be applied to various types of projects—residential; non-residential; industrial; etc (30). However, the threshold is still under development. In December 2008, staff presented the SCAQMD Governing Board with a significance threshold for industrial projects where it is the lead agency.

This threshold uses a tiered approach to determine a project's significance, with 10,000 metric tons of carbon dioxide equivalent (MTCO2e) as a screening numerical threshold for industrial projects.

The proposed project could result in potentially significant impacts related to greenhouse gas emissions and global climate change if it would:

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

A numerical threshold for determining the significance of greenhouse gas emissions in the South Coast Air Basin (Basin) has not been established by the South Coast Air Quality Management District (SCAQMD) for Projects where it is not the lead agency. As an interim threshold based on guidance provided in the CAPCOA *CEQA and Climate Change* handbook, the City has opted to use a non-zero threshold approach based on Approach 2 of the handbook. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 10,000 metric tons carbon dioxide equivalent (MTCO2E) per year for industrial projects (31). This threshold is based on the review of 711 CEQA projects. This threshold has also been adopted by the SCAQMD for industrial projects where it is the lead agency. This threshold will be utilized herein to determine if emissions of greenhouse gases from this project will be significant.

Use of the industrial threshold is most appropriate since the majority of emissions associated with the Project are a result of on-site stationary source equipment and operating activity, which is consistent with the intent in development of the SCAQMD's industrial threshold.

3 PROJECT GREENHOUSE GAS IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will result in a significant greenhouse gas impact. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related greenhouse gas impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 California Code of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to air quality if it would:

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

Under the California Environmental Quality Act (CEQA), Lead Agencies, such as the City of Lake Elsinore may adopt a Climate Action Plan (CAP) to identify measures to be undertaken within their jurisdiction to achieve the GHG reduction mandates set forth by AB 32. Projects that are consistent with the GHG reduction measures included in a CAP may be considered to have a less-than-significant impact due to GHG emissions. The City of Lake Elsinore adopted its CAP on December 13, 2011. Chapter 5.0 of the City's CAP identifies strategies and measures for achieving the required GHG reduction targets. However, with exception of GHG reduction measures enacted at the state and/or federal level to reduce mobile source-related GHG emissions, none of the GHG reduction strategies identified in the CAP are applicable to projects involving the mining and processing of aggregate resources. The CAP also identifies an efficiency target of 6.6 MT CO_2e/Service Population/year by 2020, where Service Population (SP) is considered to comprise the total number of residents plus the total number of employees. However, a Service Population-based analysis is not a viable approach for measuring whether the GHG emissions associated with an aggregate mining facility would be cumulatively considerable. In the case of the proposed Project, a total of ten employees (including eight existing and two proposed employees) would occur on-site. Under the Service Population approach, and in order to meet the City's target of 6.6 MT CO_2e/SP by Year 2020, the Project's annual GHG emissions would be limited to 66 MT CO_2e/year. Such a restriction on annual GHG emissions would render mining activities on-site entirely infeasible, and there would be no circumstances under which the Project could reasonably achieve the City's 2020 efficiency target.

In lieu of an analysis of Project consistency with the CAP, the analysis herein instead relies upon guidance from the South Coast Air Quality Management District (SCAQMD). A numerical threshold for determining the significance of greenhouse gas emissions in the South Coast Air Basin (Basin) has not been established by the SCAQMD for Projects where it is not the lead agency. As an interim threshold based on guidance provided in the CAPCOA *CEQA and Climate Change* handbook, the City has opted to use a non-zero threshold approach based on Approach 2 of the handbook. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 10,000 metric tons carbon dioxide equivalent (MTCO2E) per year for industrial projects in order to capture 90 percent of all new or modified stationary source projects.3 This threshold has also been adopted by the SCAQMD for industrial projects where it is the lead agency. As noted by SCAQMD in its December 5, 2008 Board Meeting (Agenda No. 31):

> *"…the policy objective of staff's recommended interim GHG significance threshold proposal is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change because most projects will be required to implement GHG reduction measures.Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that staff estimates that these GHG emissions would account for slightly less than one percent of future 2050 statewide GHG emissions target (85 MMT CO2e/yr). In addition, these small projects may be subject to future applicable GHG control regulations that would further reduce their overall future contribution to the statewide GHG inventory. Finally, these small sources are already subject to BACT for criteria pollutants and are more likely to be single-permit facilities, so they are more likely to have few opportunities readily available to reduce GHG emissions from other parts of their facility."*[3]

The SCAQMD further notes:

> "The 90 percent capture rate GHG significance screening level in Tier 3 for stationary sources was derived using the following methodology. Using AQMD's Annual Emission Reporting (AER) Program staff compiled reported annual natural gas consumption for 1,297 permitted facilities for 2006 through 2007 and rank-ordered the facilities to estimate the 90th percentile of the cumulative natural gas usage for all permitted facilities. Approximately 10 percent of facilities evaluated comprise more than 90 percent of the total natural gas consumption, which corresponds to 10,000 metric tons of CO2 equivalent emissions per year (MT CO2e/yr) (the majority of combustions emissions is comprised of CO2). This value represents a boiler with a rating of approximately 27 million British thermal units per hour (mmBtu/hour) of heat input, operating at a 80 percent capacity factor. It should be noted that this analysis did not include other possible GHG pollutants such as methane, N2O; a life-cycle analysis;

[3] http://www.aqmd.gov/hb/2008/December/081231a.htm

> mobile sources; or indirect electricity consumption. Therefore, when implemented, staff's recommended interim proposal is expected to capture more than 90 percent of GHG emissions from stationary source projects."[3]

Accordingly, and based on guidance from SCAQMD, the analysis herein relies on a screening-level threshold of 10,000 MT CO_2e/yr to determine if emissions of greenhouse gases from this project will be potentially significant. Use of the industrial threshold is most appropriate since the majority of emissions associated with the Project are a result of on-site stationary source equipment and operating activity, which is consistent with the intent in development of the SCAQMD's industrial threshold. In the event the proposed Project exceeds this screening level threshold, additional analysis would be required to determine whether the Project's GHG emission impacts would be cumulatively considerable.

3.3 PROJECT RELATED GREENHOUSE GAS EMISSIONS

CEQA Guidelines 15064.4 (b) (1) states that a lead agency may use a model or methodology to quantify greenhouse gas emissions associated with a project (32).

On October 2, 2013, the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) released the latest version of the California Emissions Estimator Model™ (CalEEMod™) v2013.2.2. The purpose of this model is to more accurately calculate construction-source and operational-source criteria pollutant (NO_x, VOC, PM_{10}, $PM_{2.5}$, SO_x, and CO) and greenhouse gas (GHG) emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (33). Accordingly, the latest version of CalEEMod™ has been used for this Project to determine construction and operational air quality impacts. Output from the model runs for both construction and operational activity are provided in Appendix 3.1

3.4 LIFE-CYCLE ANALYSIS

A full life-cycle analysis (LCA), which involves assessing economy-wide GHG emissions from the processes in manufacturing and transporting all raw materials used in the project development, infrastructure and on-going operations is not included in this analysis due to the lack of available guidance on LCA methodology at this time. As noted by SCAQMD in its 2008 Interim GHG Significance Threshold Staff Proposal:

> *"Performing a life cycle analysis may be difficult for a number of projects or processes because life cycle emission factors may not be well established for many activities or projects and the life cycle process itself may not be known or well-defined. SCAQMD staff, however, recommends that life cycle analyses be prepared for all projects undergoing a CEQA analysis, as this will produce a more defensible approach. If, however, any component of the life cycle analysis is unavailable, unknown, or not supported by scientific evidence, the lead agency should note such an analysis would be speculative pursuant to CEQA Guidelines §15145 and terminate discussion of that impact." (34)*

Life-cycle analysis depends on emission factors or econometric factors that are not well established for all processes. In the case of the proposed Project, it is not possible to project the precise end uses of aggregate materials produced on-site, as the end uses for aggregate materials varies depending on economic circumstances, development projects that may be implemented, etc. Furthermore, the majority of end uses of aggregate and/or asphalt material produced on-site would occur as part of separate development proposals, which would be subject to project-level review under CEQA. Accordingly, at this time a LCA would be extremely speculative and is not legally required by CEQA (CEQA Guidelines § 15145).

3.5 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of CO_2, CH_4, and N_2O from the following primary sources: On-Site Equipment and Mobile Source (Passenger Cars and Truck Traffic) Emissions. The Project will not result in an increase in the amount of natural gas associated with aggregate usage (since aggregate usage does not currently use any natural gas), the Project will result in a 35.1% increase in electricity associated with the aggregate production. It should be noted that natural gas is utilized in conjunction with the asphalt batch plant operations and 100% of the asphalt batch plant's demand for natural gas is reflected in the emissions summary for the asphalt batch plant.

3.5.1 OPERATIONAL EQUIPMENT

Table 3-1 summarizes the equipment utilized at the Mine on a daily basis for the baseline operating period, proposed project operating characteristics, and net new equipment activity. As shown, mining activities during the baseline period result in approximately 20,316 horsepower hours per day. However, during most of the baseline operating period, the Mine was under different ownership, and the equipment utilized during that period is not reflective of the equipment that has been utilized on-site since 2014. At the time the Project's Notice of Preparation (NOP) was distributed for public review in July 2015, existing mining operations on-site were estimated to be approximately 25,148 horsepower hours per day (hh/d), representing an approximate 23.8% increase as compared to the horsepower hours per day that was were associated with mining operations under previous ownership. Although the Project would not increase the amount of hh/d as compared to the existing operational conditions that existed on-site at the time the Project's NOP was distributed for public review, in an effort to be conservative and consistent with the annual tonnage increase of 35.1%, the analysis herein increases the Project's hh/d to approximately 35.1% above what was in use under previous ownership. Thus, for analytical purposes herein, it is assumed that equipment used under the proposed Project would require approximately 27,495 horsepower hours per day, reflecting an approximate 35.1% increase in horsepower as compared to the baseline condition.

TABLE 3-1: OPERATIONAL EQUIPMENT

Baseline Operational Equipment Summary				
Hours/Day	Description	Quantity	Horsepower	Total Horsepower Hours Per Day
2	Skidsteer	1	51	102
6	769C Haul Truck	1	474	2,844
10	980K Wheel Loader	1	406	4,060
10	980H Wheel Loader	1	393	3,930
10	988G Wheel Loader	1	520	5,200
4	D8R Dozer	1	337	1,348
8	Water Truck 4000 Gal	1	354	2,832
Total Baseline Horsepower Hours				**20,316**
Proposed Project Equipment Summary				
Hours/Day	Description	Quantity	Horsepower	Total Horsepower Hours Per Day
4	Skidsteer	1	51	204
8	769C Haul Truck	2	474	7,584
10	980K Wheel Loader	1	406	4,060
10	980H Wheel Loader	1	393	3,930
10	988G Wheel Loader	1	520	5,200
4	D8R Dozer	1	337	1,348
8	Water Truck 4000 Gal	1	354	2,832
Subtotal Project Horsepower Hours				**25,158**
Additional Equipment Summary				
Hours/Day	Description	Quantity	Horsepower	Total Horsepower Hours Per Day
4	Skidsteer	1	51	204
4.4	769C Haul Truck	1	474	2,085
Subtotal Additional Equipment Horsepower Hours				**2,289**
Total Project Horsepower Hours				**27,447**
Net New Project Equipment Summary				
Hours/Day	Description	Quantity	Horsepower	Total Horsepower Hours Per Day
6	Skidsteer	1	51	306
2	769C Haul Truck	1	474	948
8	769C Haul Truck	1	474	3,792
4.4	769C Haul Truck	1	474	2,085
Total Net New Project Horsepower Hours				**7,131**

3.5.2 MOBILE SOURCE EMISSIONS

As shown in the Project's traffic study (34), the Project is anticipated to generate 140 net new daily truck trips above the historical baseline and 4 net new employee trips above the historical baseline.

The CalEEMod default of a 20-mile one-way trip length for trucks was increased to 25 miles based on discussion with the Project applicant and based on regional aggregate studies that have found that 25 miles is generally the maximum distance for aggregate to travel before the cost outweigh distance of travel (35) (36).

The Project is anticipated to serve a regional need and will likely reduce vehicle miles traveled (VMT) in the long term by diverting trips that would otherwise travel to other aggregate facilities in the region. Notwithstanding, for purposes of this analysis, no "credit" has been taken and emissions associated with the Project are considered "new" as a conservative measure.

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 in the long term. Project aggregate made available by the proposed expansion area will replace materials hauled from farther distances in the long term and supply new demand for aggregate that will occur in the Riverside 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) (35). 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 AQ and GHG emissions for various projects. One particular mitigation measure for reducing AQ and GHG emissions during construction activity is Mitigation Measure C-5 "Use of Local Building Materials." The Project will provide local building materials to serve the demand for aggregate resources in the local area, thus resulting in a reduction in emissions associated with transport of materials from sources of aggregate products located further away. However, no "credit" is taken for this measure in this analysis in an effort to be conservative.

3.5.3 ASPHALT BATCH PLANT EMISSIONS

The Nichols North site is also subject to approved Conditional Use Permit (CUP 2014-07) which allows for the operation of a portable asphalt batch plant on approximately 1.76 acres of the Project site. Although the asphalt batch plant is previously approved, entitled, and permitted, the analysis in this GHGA conservatively assumes 100% of the impacts from the previously entitled asphalt batch plant. GHG emissions associated with the asphalt batch plant include emissions associated with on-site dryers, oil heaters/natural gas usage, and electricity usage. GHG emissions associated with asphalt batch plant activity were obtained from the report *Comparison of Uncontrolled and Controlled Hot Mix Asphalt Plant Emissions* prepared by Associates Environmental and is included in its entirety in Appendix 3.2.

3.6 NET EMISSIONS SUMMARY

The total amount of net new Project-related GHG emissions would total 9,836.53 MMTCO_2e as shown on Table 3-2. The net new Project-related GHG emissions would not exceed the SCAQMD's industrial threshold of 10,000 MTCO2e per year. Therefore, impacts associated with GHG emissions will be less than significant.

TABLE 3-2: NET NEW PROJECT GREENHOUSE GAS EMISSIONS

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Operational Equipment	432.49	0.13	--	435.24
Electricity from Aggregate Process	92.4	--	--	92.4
Mobile Sources	1,844.56	0.01	--	1,844.84
Asphalt Batch Plant	7,464.05	--	--	7,464.05
Total CO_2E (All Sources)	9,836.53			
SCAQMD Threshold	**10,000**			
Threshold Exceeded?	**NO**			

Source: CalEEMod™ model output, See Appendix 3.1 for detailed model outputs.
Note: Totals obtained from CalEEMod™ and may not total 100% due to rounding.

Table results include scientific notation. *e* is used to represent *times ten raised to the power of* (which would be written as x 10^b") and is followed by the value of the exponent

3.7 CONCLUSION

FACTOR NO. 1: The extent to which the project may generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance.

As shown on Table 3-2 the project will result in approximately 9,836.53 $MTCO_2e$ per year; the proposed project would not exceed the SCAQMD's interim threshold of 10,000 $MTCO_2e$ per year. Therefore, a less than significant impact will occur.

FACTOR NO. 2: The extent to which the project may conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

ARB's *Scoping Plan* identifies strategies to reduce California's greenhouse gas emissions in support of AB32. Many of the strategies identified in the Scoping Plan are not applicable at the project level, such as long-term technological improvements to reduce emissions from vehicles. Some measures are applicable and supported by the project, such as energy efficiency. Finally, while some measures are not directly applicable, the project would not conflict with their implementation. Reduction measures are grouped into 18 action categories, as follows:

1. **California Cap-and-Trade Program Linked to Western Climate Initiative Partner Jurisdictions.** Implement a broad-based California cap-and-trade program to provide a firm limit on emissions. Link the California cap–and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California.[4] Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.
2. **California Light-Duty Vehicle Greenhouse Gas Standards.** Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.
3. **Energy Efficiency.** Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities).
4. **Renewables Portfolio Standards.** Achieve 332 percent renewable energy mix statewide.
5. **Low Carbon Fuel Standard.** Develop and adopt the Low Carbon Fuel Standard.
6. **Regional Transportation-Related Greenhouse Gas Targets.** Develop regional greenhouse gas emissions reduction targets for passenger vehicles.
7. **Vehicle Efficiency Measures.** Implement light-duty vehicle efficiency measures.
8. **Goods Movement.** Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.

[4] California Air Resources Board. California GHG Emissions – Forecast (2002-2020). October 2010

9. **Million Solar Roofs Program.** Install 3,000 megawatts of solar-electric capacity under California's existing solar programs.
10. **Medium- and Heavy-Duty Vehicles.** Adopt medium- (MD) and heavy-duty (HD) vehicle efficiencies. Aerodynamic efficiency measures for HD trucks pulling trailers 53-feet or longer that include improvements in trailer aerodynamics and use of rolling resistance tires were adopted in 2008 and went into effect in 2010.[5] Future, yet to be determined improvements, includes hybridization of MD and HD trucks.
11. **Industrial Emissions.** Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.
12. **High Speed Rail.** Support implementation of a high speed rail system.
13. **Green Building Strategy.** Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
14. **High Global Warming Potential Gases.** Adopt measures to reduce high warming global potential gases.
15. **Recycling and Waste.** Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.
16. **Sustainable Forests.** Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation. The 2020 target for carbon sequestration is 5 million MTCO2E/YR.
17. **Water.** Continue efficiency programs and use cleaner energy sources to move and treat water.
18. **Agriculture.** In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020.

Table 3-3 summarizes whether the project would conflict with the State Scoping Plan. As summarized, the project will not conflict with any of the provisions of the Scoping Plan and in fact supports seven of the action categories through energy efficiency, water conservation, recycling, and landscaping.

[5] California Air Resources Board. Scoping Plan Measures Implementation Timeline. October 2010

TABLE 3-3 SCOPING PLAN CONFLICT SUMMARY

Action	Supporting Measures[6]	Conflict
Cap-and-Trade Program	--	Not Applicable. These programs involve capping emissions from electricity generation, industrial facilities, and broad scoped fuels. Caps do not directly affect light industrial projects.
Light-Duty Vehicle Standards	T-1	Not Applicable. This is a statewide measure establishing vehicle emissions standards.
Energy Efficiency	E-1 E-2 CR-1 CR-2	Not Applicable. The project is not proposing the construction of any new building structures.
Renewables Portfolio Standard	E-3	Not Applicable. Establishes the minimum statewide renewable energy mix.
Low Carbon Fuel Standard	T-2	Not Applicable. Establishes reduced carbon intensity of transportation fuels.
Regional Transportation-Related Greenhouse Gas Targets	T-3	Not Applicable. This is a statewide measure and is not within the purview of this Project.
Vehicle Efficiency Measures	T-4	Not Applicable. Identifies measures such as minimum tire-fuel efficiency, lower friction oil, and reduction in air conditioning use.
Goods Movement	T-5 T-6	Not applicable. Identifies measures to improve goods movement efficiencies such as advanced combustion strategies, friction reduction, waste heat recovery, and electrification of accessories. While these measures are yet to be implemented and will be voluntary, the proposed Project would not interfere with their implementation.
Million Solar Roofs (MSR) Program	E-4	Not applicable. The Project is not changing any of the existing energy demand requirements and is not constructing any physical structures.

[6] Supporting measures can be found at the following link: http://www.arb.ca.gov/cc/scopingplan/2013_update/appendix_b.pdf

Action	Supporting Measures[6]	Conflict
Medium- & Heavy-Duty Vehicles	T-7	The Project would not conflict with this measure. MD and HD trucks and trailers working from the proposed Project will be subject to aerodynamic and hybridization requirements as established by ARB; no feature of the project would interfere with implementation of these requirements and programs.
	T-8	
Industrial Emissions	I-1	Not Applicable. These measures are applicable to large industrial facilities (> 500,000 MTCOE2/YR) and other intensive uses such as refineries.
	I-2	
	I-3	
	I-4	
	I-5	
High Speed Rail	T-9	Not Applicable. Supports increased mobility choice.
Green Building Strategy	GB-1	Not Applicable. The project is not proposing the construction of any new building structures.
High Global Warming Potential Gases	H-1	Not Applicable. The proposed warehouses are not substantial sources of high GWP emissions and will comply with any future changes in air conditioning, fire protection suppressant, and other requirements.
	H-2	
	H-3	
	H-4	
	H-5	
	H-6	
	H-7	
Recycling and Waste	RW-1	Not Applicable. The project is not proposing the construction of any new building structures.
	RW-2	
	RW-3	
Sustainable Forests	F-1	Not Applicable. The project is not proposing the construction of any new building structures.
Water	W-1	Not Applicable. The project is not proposing the construction of any new building structures.
	W-2	
	W-3	
	W-4	
	W-5	
	W-6	
Agriculture	A-1	Not Applicable. The project is not an agricultural use.

This page intentionally left blank

4 REFERENCES

1. **United Nations.** Flexible GHG Data Queries. [Online] [Cited: November 13, 2013.] http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3841.php.
2. **U.S. Energy Information Administration.** [Online] http://www.eia.gov/.
3. **Environmental Protection Agency.** Inventory of U.S. Greenhouse Gas Emissions and Sinks. [Online] April 12, 2013. http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf.
4. **Air Resources Board.** Greenhouse Gas Inventory Data - 2000 to 2011. [Online] [Cited: November 13, 2013.] http://www.arb.ca.gov/cc/inventory/data/data.htm.
5. **World Resources Institute.** Climate Analysis Indicator Tool (CAIT). [Online] [Cited: 13 2013, November.] http://cait.wri.org.
6. **Air Resources Board.** Reducing Climate Change Emissions From Motor Vehicles. [Online] [Cited: November 13, 2013.] http://www.arb.ca.gov/cc/factsheets/ccfactsheet.pdf.
7. *The Carbon Cycle and Climate Change.* **Bennington, Bret J.** 1, s.l. : Brooks/Cole. ISBN 1 3: 978-0-495-73855-8.
8. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report.* **International Panel on Climate Change.** 4, 2007.
9. *Occupational Safety and Health Guideline for Nitrous Oxide.* **U.S. Department of Labor.**
10. **Environmental Protection Agency.** Overview of Greenhouse Gases. [Online] [Cited: November 13, 2013.] http://www.epa.gov/highgwp/scientific.html.
11. **American Lung Association.** Climate Change. [Online] 2013. [Cited: November 13, 2013.] http://www.lung.org/associations/states/california/advocacy/climate-change/.
12. **The National Institute for Occupational Safety and Health.** [Online] [Cited: November 13, 2013.] http://www.cdc.gov/niosh/.
13. **Occupational Health and Safety Administration.** [Online] [Cited: November 13, 2013.] https://www.osha.gov/.
14. **Hardin, Mary and Kahn, Ralph.** Aerosols & Climate Change. *Earth Observatory.* [Online] http://earthobservatory.nasa.gov/Features/Aerosols/.
15. **Environmental Protection Agency.** Air Pollution and the Clean Air Act. [Online] [Cited: November 13, 2013.] http://www.epa.gov/air/caa/.
16. **Building Standards Commission.** California Building Standards Code (Title 24, California Code of Regulations). [Online] [Cited: 13 2013, November.] http://www.bsc.ca.gov/codes.aspx.
17. —. CALGreen. [Online] 2010. [Cited: November 13, 2013.] http://www.bsc.ca.gov/home/calgreen.aspx.
18. **Air Resources Board.** Clean Car Standards - Pavley, Assembly Bill 1493. [Online] September 24, 2009. [Cited: November 13, 2013.] http://www.arb.ca.gov/cc/ccms/ccms.htm.
19. **Environmental Protection Agency.** State and Local Climate and Energy Program. [Online] [Cited: November 13, 2013.] http://www.epa.gov/statelocalclimate/state/tracking/individual/ca.html.
20. **Air Resources Board.** Assembly Bill 32: Global Warming Solutions Act. [Online] 2006. [Cited: September 17, 2014.] http://www.arb.ca.gov/cc/ab32/ab32.htm.

21. —. Status of Scoping Plan Recommended Measures. [Online] July 25, 2011. [Cited: September 23, 2014.] http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf.
22. —. Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document. [Online] August 19, 2011. [Cited: September 23, 2014.] http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf.
23. —. Climate Change Scoping Plan First Update, Discussion Draft for Public Review and Comment. [Online] May 22, 2014. [Cited: September 23, 2014.] http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.
24. **California Energy Commission.** SB 1368 Emission Performance Standards. [Online] September 29, 2006. [Cited: November 13, 2013.] http://www.energy.ca.gov/emission_standards/.
25. **State of California.** Senate Bill No. 97. [Online] [Cited: November 13, 2013.] http://opr.ca.gov/docs/SB_97_bill_20070824_chaptered.pdf.
26. —. California Climate Change Executive Orders. [Online] http://www.climatechange.ca.gov/state/executive_orders.html.
27. —. Senate Bill No. 1078. [Online] http://www.energy.ca.gov/portfolio/documents/documents/SB1078.PDF.
28. —. EXECUTIVE ORDER S-14-08. [Online] [Cited: November 13, 2013.] http://gov.ca.gov/news.php?id=11072.
29. **City of Lake Elsinore.** *Climate Action Plan.* s.l. : Rincon Consultants, Inc., 2011.
30. **South Coast Air Quality Management District.** Greenhouse Gases (GHG) CEQA Significance Thresholds. [Online] [Cited: July 8, 2016.] http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds.
31. —. BOARD MEETING DATE: December 5, 2008 Agenda No. 31. *South Coast Air Quality Management District.* [Online] December 5, 2008. http://www.aqmd.gov/hb/2008/December/081231a.htm .
32. **California Environmental Quality Act.** Addressing Analysis and Mitigation of Greenhouse Gas . [Online] [Cited: Noveber 13, 2013.] http://ceres.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf.
33. **South Coast Air Quality Management District.** California Emissions Estimator Model. [Online] 2013. [Cited: November 13, 2013.] http://www.caleemod.com/.
34. —. Draft Guidance Document - Interim CEQA Greenhouse Gas (GHG) Significance Threshold. [Online] October 2008. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf?sfvrsn=2.
35. **Urban Crossroads, Inc.** *Amendment No. 2 to Reclamation Plan 2006-01 Traffic Impact Analysis.* Irvine : s.n., 2016.
36. **Berck, Dr. Peter.** [Online] University of California Berkeley, January 2005. [Cited: October 1, 2015.] http://are.berkeley.edu/~pberck/Research/WP%20994%20Berck-Aggregrates%20IV.pdf.
37. **SANDAG.** *San Diego Region Aggregate Supply Study.* http://www.sandag.org/uploads/publicationid/publicationid_1558_12638.pdf : s.n., 2011.
38. **South coast Air Quality Management District.** CEQA Air Quality Handbook (1993). [Online] 1993. [Cited: November 13, 2013.] http://www.aqmd.gov/ceqa/oldhdbk.html.
39. **California Environmental Quality Act.** Checklist. [Online] [Cited: September 17, 2014.] http://ceres.ca.gov/ceqa/guidelines/Appendix_G.html.

7 CERTIFICATION

The contents of this greenhouse gas study report represent an accurate depiction of the greenhouse gas impacts associated with the proposed Amendment No. 2 to Reclamation Plan 2006-01 Project. The information contained in this greenhouse gas report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 660-1994 ext. 217.

Haseeb Qureshi
Senior Associate
URBAN CROSSROADS, INC.
41 Corporate Park, Suite 300
Irvine, CA 92606
(949) 660-1994 x217
hqureshi@urbanxroads.com

Education

Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

Professional Affiliations

AEP – Association of Environmental Planners

AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

Professional Certifications

Planned Communities and Urban Infill – Urban Land Institute • June, 2011

Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008

Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007

AB2588 Regulatory Standards – Trinity Consultants • November, 2006

Air Dispersion Modeling – Lakes Environmental • June, 2006

This page intentionally left blank

APPENDIX 3.1:

CALEEMOD EMISSIONS MODEL OUTPUTS

Nichols Mine -Proposed Project

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Manufacturing	1.00	1000sqft	0.02	1,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 31

Climate Zone 10 **Operational Year** 2016

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 630.89 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Monday-Saturday Operations

Off-road Equipment - Initial Study

Off-road Equipment - Project Equipment

Trips and VMT - Number of trips = net new passenger car and truck trips per the Traffic Impact Analysis. Haul Trip Length estimated to be 25 miles one-way based on discussion with applicant.

Vehicle Trips - Mobile Sources Modeled in Construction section of CalEEMod.

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Consumer Products - Project modeled within "construction" portion of CalEEMod

Area Coating - Project modeled within "construction" portion of CalEEMod

Landscape Equipment - Project modeled within "construction" portion of CalEEMod

Energy Use - Project modeled within "construction" portion of CalEEMod

Water And Wastewater - Project modeled within "construction" portion of CalEEMod

Solid Waste - Project modeled within "construction" portion of CalEEMod

Construction Off-road Equipment Mitigation - Mitigation Measure AQ-1

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Interior	1500	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.36	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	T24E	2.69	0.00
tblEnergyUse	T24NG	16.16	0.00
tblOffRoadEquipment	HorsePower	400.00	474.00
tblOffRoadEquipment	HorsePower	400.00	474.00
tblOffRoadEquipment	HorsePower	64.00	51.00
tblOffRoadEquipment	HorsePower	400.00	474.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblProjectCharacteristics	OperationalYear	2014	2016
tblSolidWaste	SolidWasteGenerationRate	1.24	0.00
tblTripsAndVMT	HaulingTripLength	20.00	25.00
tblTripsAndVMT	HaulingTripNumber	0.00	43,820.00
tblTripsAndVMT	WorkerTripNumber	10.00	4.00
tblVehicleTrips	ST_TR	1.49	0.00
tblVehicleTrips	SU_TR	0.62	0.00
tblVehicleTrips	WD_TR	3.82	0.00
tblWater	IndoorWaterUseRate	231,250.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.7809	11.6465	7.0902	0.0248	0.4762	0.2617	0.7379	0.1305	0.2408	0.3713	0.0000	2,277.0564	2,277.0564	0.1439	0.0000	2,280.0775
Total	**0.7809**	**11.6465**	**7.0902**	**0.0248**	**0.4762**	**0.2617**	**0.7379**	**0.1305**	**0.2408**	**0.3713**	**0.0000**	**2,277.0564**	**2,277.0564**	**0.1439**	**0.0000**	**2,280.0775**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.5137	8.2204	7.3869	0.0248	0.4762	0.1246	0.6008	0.1305	0.1152	0.2458	0.0000	2,277.0559	2,277.0559	0.1439	0.0000	2,280.0770
Total	**0.5137**	**8.2204**	**7.3869**	**0.0248**	**0.4762**	**0.1246**	**0.6008**	**0.1305**	**0.1152**	**0.2458**	**0.0000**	**2,277.0559**	**2,277.0559**	**0.1439**	**0.0000**	**2,280.0770**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**34.21**	**29.42**	**-4.18**	**0.00**	**0.00**	**52.39**	**18.58**	**0.00**	**52.14**	**33.81**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.9000e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.9000e-003**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.9000e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.9000e-003**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Project Equipment	Trenching	1/1/2016	12/30/2016	6	313	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Project Equipment	Off-Highway Trucks	1	2.00	474	0.38
Project Equipment	Off-Highway Trucks	1	8.00	474	0.38
Project Equipment	Skid Steer Loaders	1	6.00	51	0.37
Project Equipment	Off-Highway Trucks	1	4.40	474	0.38

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Project Equipment	4	4.00	0.00	43,820.00	14.70	6.90	25.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Project Equipment - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3256	3.7661	1.8197	4.5900e-003		0.1446	0.1446		0.1330	0.1330	0.0000	432.4979	432.4979	0.1305	0.0000	435.2375
Total	**0.3256**	**3.7661**	**1.8197**	**4.5900e-003**		**0.1446**	**0.1446**		**0.1330**	**0.1330**	**0.0000**	**432.4979**	**432.4979**	**0.1305**	**0.0000**	**435.2375**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.4528	7.8767	5.2322	0.0201	0.4693	0.1171	0.5864	0.1287	0.1077	0.2364	0.0000	1,838.1239	1,838.1239	0.0131	0.0000	1,838.3981
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5100e-003	3.6900e-003	0.0383	8.0000e-005	6.8700e-003	6.0000e-005	6.9300e-003	1.8200e-003	5.0000e-005	1.8800e-003	0.0000	6.4346	6.4346	3.5000e-004	0.0000	6.4419
Total	**0.4553**	**7.8804**	**5.2706**	**0.0202**	**0.4762**	**0.1171**	**0.5933**	**0.1305**	**0.1077**	**0.2383**	**0.0000**	**1,844.5585**	**1,844.5585**	**0.0134**	**0.0000**	**1,844.8400**

3.2 Project Equipment - 2016

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0585	0.3401	2.1163	4.5900e-003		7.4800e-003	7.4800e-003		7.4800e-003	7.4800e-003	0.0000	432.4974	432.4974	0.1305	0.0000	435.2370
Total	**0.0585**	**0.3401**	**2.1163**	**4.5900e-003**		**7.4800e-003**	**7.4800e-003**		**7.4800e-003**	**7.4800e-003**	**0.0000**	**432.4974**	**432.4974**	**0.1305**	**0.0000**	**435.2370**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.4528	7.8767	5.2322	0.0201	0.4693	0.1171	0.5864	0.1287	0.1077	0.2364	0.0000	1,838.1239	1,838.1239	0.0131	0.0000	1,838.3981
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5100e-003	3.6900e-003	0.0383	8.0000e-005	6.8700e-003	6.0000e-005	6.9300e-003	1.8200e-003	5.0000e-005	1.8800e-003	0.0000	6.4346	6.4346	3.5000e-004	0.0000	6.4419
Total	**0.4553**	**7.8804**	**5.2706**	**0.0202**	**0.4762**	**0.1171**	**0.5933**	**0.1305**	**0.1077**	**0.2383**	**0.0000**	**1,844.5585**	**1,844.5585**	**0.0134**	**0.0000**	**1,844.8400**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Manufacturing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Manufacturing	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.514315	0.060290	0.180146	0.139458	0.042007	0.006636	0.015782	0.029894	0.001929	0.002512	0.004343	0.000595	0.002093

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.9000e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	3.9000e-003	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.6100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**3.9000e-003**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Consumer Products	3.6100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Architectural Coating	2.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.9000e-003**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Manufacturing	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Manufacturing	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

APPENDIX 3.2:

ASPHALT BATCH PLANT EMISSIONS

Associates Environmental

Comparison of Uncontrolled and Controlled Hot Mix Asphalt Plant Emissions

Covering:

Nichols Road Partners, LLC
24890 Maitri Road
Corona, CA 90717

Prepared For:

Nichols Road Partners, LLC
P.O. Box 78450
Corona, CA 92877

Prepared by:

Associates Environmental
16882 Bolsa Chica Street, Suite 202
Huntington Beach, CA 92649

Project No: 440

TABLE OF CONTENTS

Introduction:

Nichols Road Partners, LLC is proposing to install a Hot Mix Asphalt (HMA) Plant at its Nichols Road location. Nichols Road Partners, LLC has requested that Associates Environmental (AE) prepare an evaluation which compares emissions from the following two scenarios:

- Scenario One: An uncontrolled (or modestly controlled) HMA Plant, relying largely on default EPA emission factors and uncontrolled PM_{10} values.
- Scenario Two: An HMA Plant subject to Best Available Control Technology (BACT), which the facility will be required to implement upon receiving permits to operate from the South Coast Air Quality Management District (SCAQMD).

Assumptions and Emission Factors:

Associates Environmental developed a general plant layout and flow diagram as presented in Appendix A. Six emission sources related to the operation of the HMA Plant were considered:

- Cold Feed System
- Asphalt Drum Dryer
- Asphalt Silo Loading
- Asphalt Load Out
- Hot Oil Heater
- Asphalt Oil Storage Tank

PM_{10} emissions from the Cold Feed System were estimated using emission factors obtained from the Environmental Protection Agency's AP-42, Chapter 11.19.2, Table 11.19.2-2 (see Appendix B). The difference in the uncontrolled and controlled scenarios was the use of water sprays in the controlled scenario.

Emissions from the Asphalt Drum Dryer, Silo Loading and Asphalt Load Out uncontrolled scenario were estimated using emission factors obtained from the document, "Hot Mix Asphalt Plants Emission Estimation Report, EPA-454/R-00-019, December, 2000". Table 2: Estimated Annual Emissions for a Typical Drum Mix HMA Facility (see Appendix C). For the controlled scenario, emissions from the HMA Plant were estimated based on source test results for a similar facility operating in the SCAQMD (see Appendix D). Controlled PM_{10} and VOC emissions from the Silo Loading and Asphalt Load Out sources were calculated by applying a control factor corresponding to the use of a SCAQMD-required blue smoke control system.

Emissions from the Hot Oil Heater are minimal and are estimated to be identical in the uncontrolled and controlled scenarios. VOC emissions from the Asphalt Oil Storage Tank were calculated using EPA's TANKS 4.0.9d program (see Appendix E). Controlled VOC emissions from the Asphalt Oil Storage Tank were calculated by applying a control factor corresponding to the use of a SCAQMD-required condenser.

Assumptions related to asphalt production are as follows:

- Maximum Hourly Production: 300 tons
- Maximum Daily Production: 2,000 tons
- Maximum Annual Production: 330,000 tons

Emissions Calculation Summaries:

Scenario One uncontrolled emissions are presented in the following table. Calculations supporting the Scenario One uncontrolled emissions summary are included as Attachment 1.

Asphalt Plant Summary: Scenario One - Uncontrolled Emissions

Hourly Emissions

Source	PM10 (lbs/hr)	NOx (lbs/hr)	VOC (lbs/hr)	CO (lbs/hr)	SOx (lbs/hr)
Cold Feed System	4.389	--	--	--	--
Asphalt Drum Dryer	6.900	7.80	9.60	39.00	1.02
Asphalt Silo Loading	0.176	--	3.66	0.35	--
Asphalt Load Out	0.157	--	1.17	0.40	--
Hot Oil Heater	0.009	0.03	0.01	0.37	0.00
Asphalt Oil Storage Tank	--	--	0.00	--	--
Total	11.630	7.830	14.440	40.124	1.021

Daily Emissions

Source	PM10 (lbs/day)	NOx (lbs/day)	VOC (lbs/day)	CO (lbs/day)	SOx (lbs/day)
Cold Feed System	27.075	--	--	--	--
Asphalt Drum Dryer	46.000	52.00	64.00	260.00	6.80
Asphalt Silo Loading	1.172	--	24.37	2.36	--
Asphalt Load Out	1.044	--	7.82	2.70	--
Hot Oil Heater	0.176	0.60	0.16	7.31	0.01
Asphalt Oil Storage Tank	--	--	4.75	--	--
Total	75.467	52.600	101.109	272.369	6.814

Annual Emissions

Source	PM10 (tons/yr)	NOx (tons/yr)	VOC (tons/yr)	CO (tons/yr)	SOx (tons/yr)	CO2e (mtons/yr)
Cold Feed System	2.234	--	--	--	--	--
Asphalt Drum Dryer	3.795	4.29	5.28	21.45	0.56	7,005.50
Asphalt Silo Loading	0.097	--	2.01	0.19	--	--
Asphalt Load Out	0.086	--	0.65	0.22	--	--
Hot Oil Heater	0.032	0.11	0.03	1.32	0.00	458.54
Asphalt Oil Storage Tank	--	--	0.39	--	--	--
Total	6.243	4.398	8.358	23.183	0.564	7,464.05

Scenario Two controlled emissions are presented in the following table. Calculations supporting the Scenario Two controlled emissions summary are included as Attachment 2.

<u>Asphalt Plant Summary: Scenario Two - Controlled Emissions</u>

<u>Hourly Emissions</u>

Source	PM10 (lbs/hr)	NOx (lbs/hr)	VOC (lbs/hr)	CO (lbs/hr)	SOx (lbs/hr)
Cold Feed System	0.353	--	--	--	--
Asphalt Drum Dryer	1.373	2.85	1.26	13.07	0.62
Asphalt Silo Loading	0.018	--	0.37	0.35	--
Asphalt Load Out	0.016	--	0.12	0.40	--
Hot Oil Heater	0.009	0.03	0.01	0.37	0.00
Asphalt Oil Storage Tank	--	--	0.00	--	--
Total	1.768	2.877	1.760	14.192	0.621

<u>Daily Emissions</u>

Source	PM10 (lbs/day)	NOx (lbs/day)	VOC (lbs/day)	CO (lbs/day)	SOx (lbs/day)
Cold Feed System	2.056	--	--	--	--
Asphalt Drum Dryer	9.153	18.98	8.41	87.12	4.14
Asphalt Silo Loading	0.117	--	2.44	2.36	--
Asphalt Load Out	0.104	--	0.83	2.70	--
Hot Oil Heater	0.176	0.60	0.16	7.31	0.01
Asphalt Oil Storage Tank	--	--	0.48	--	--
Total	11.606	19.584	12.316	99.487	4.150

<u>Annual Emissions</u>

Source	PM10 (tons/yr)	NOx (tons/yr)	VOC (tons/yr)	CO (tons/yr)	SOx (tons/yr)	CO2e (mtons/yr)
Cold Feed System	0.170	--	--	--	--	--
Asphalt Drum Dryer	0.755	1.57	0.69	7.19	0.34	7,005.50
Asphalt Silo Loading	0.010	--	0.20	0.19	--	--
Asphalt Load Out	0.009	--	0.07	0.22	--	--
Hot Oil Heater	0.032	0.11	0.03	1.32	0.00	458.54
Asphalt Oil Storage Tank	--	--	0.04	--	--	--
Total	0.975	1.674	1.032	8.920	0.344	7,464.05

Associates Environmental

Section 1

Uncontrolled Emissions Calculations

Hot Mix Asphalt Plant: Cold Feed System Uncontrolled Emission Calculations

Below are the estimated PM10 emissions from the aggregate/RAP systems. Emissions factors were obtained from AP-42, Table 11.19.2-2 to estimate the PM10 emissions.

Maximum Asphalt Processed	300	tons/hr
	2,000	tons/day
	330,000	tons/yr

Hourly Emissions

Description	Material	Production (tons/hr)	x	AP-42 PM10 Emission Factor (lbs/tons)	x	=	PM10 Emissions (lbs/hr)	
Bins Feeding	Aggregate	142.50		0.0011			0.16	
Conveyors BF1 - BF5	Aggregate	142.50		0.0011			0.16	
Conveyor CC	Aggregate	142.50		0.0011			0.16	
Scalping Screen	Aggregate	142.50		0.0087			1.24	
Conveyor BC1	Aggregate	142.50		0.0011			0.16	
Bins Feeding	RAP	142.50		0.0011			0.16	
Conveyors RF1 - RF2	RAP	142.50		0.0011			0.16	
Conveyor RCC	RAP	142.50		0.0011			0.16	
Conveyor RC1	RAP	142.50		0.0011			0.16	
2-Deck Screen	RAP	142.50		0.0087			1.24	
HSI Crusher	RAP	142.50		0.0024			0.34	
Conveyor RC2	RAP	142.50		0.0011			0.16	
Conveyor RC3	RAP	142.50		0.0011			0.16	
					Total		4.39	lbs/hr

Emission factors obtained from AP42 Chapter 11.19.2, Table 11.19.2-2.

Daily Emissions

Description	Material	Production (tons/day)	x	AP42 PM10 Emission Factor (lbs/tons)	x	=	PM10 Emissions (lbs/day)	
Bins Feeding	Aggregate	1,425.00		0.0011			1.57	
Conveyors BF1 - BF5	Aggregate	1,425.00		0.0011			1.57	
Conveyor CC	Aggregate	1,425.00		0.0011			1.57	
Scalping Screen	Aggregate	1,425.00		0.0087			12.40	
Conveyor BC1	Aggregate	1,425.00		0.0011			1.57	
Bins Feeding	RAP	475.00		0.0011			0.52	
Conveyors RF1 - RF2	RAP	475.00		0.0011			0.52	
Conveyor RCC	RAP	475.00		0.0011			0.52	
Conveyor RC1	RAP	475.00		0.0011			0.52	
2-Deck Screen	RAP	475.00		0.0087			4.13	
HSI Crusher	RAP	475.00		0.0024			1.14	
Conveyor RC2	RAP	475.00		0.0011			0.52	
Conveyor RC3	RAP	475.00		0.0011			0.52	
					Total		27.08	lbs/day

Emission factors obtained from AP42 Chapter 11.19.2, Table 11.19.2-2.

Annual Emissions

Description	Material	Production (tons/yr)	x	AP42 PM10 Emission Factor (lbs/tons)	x	=	PM10 Emissions (lbs/yr)	
Bins Feeding	Aggregate	235,125		0.0011			258.64	
Conveyors BF1 - BF5	Aggregate	235,125		0.0011			258.64	
Conveyor CC	Aggregate	235,125		0.0011			258.64	
Scalping Screen	Aggregate	235,125		0.0087			2045.59	
Conveyor BC1	Aggregate	235,125		0.0011			258.64	
Bins Feeding	RAP	78,375		0.0011			86.21	
Conveyors RF1 - RF2	RAP	78,375		0.0011			86.21	
Conveyor RCC	RAP	78,375		0.0011			86.21	
Conveyor RC1	RAP	78,375		0.0011			86.21	
2-Deck Screen	RAP	78,375		0.0087			681.86	
HSI Crusher	RAP	78,375		0.0024			188.10	
Conveyor RC2	RAP	78,375		0.0011			86.21	
Conveyor RC3	RAP	78,375		0.0011			86.21	
					Total		4,467.38	
							2.23	tons/yr

Emission factors obtained from AP42 Chapter 11.19.2, Table 11.19.2-2.

Hot Mix Asphalt Emissions: Uncontrolled Asphalt Drum Dryer, Silo Loading and Asphalt Load Out Emissions

Burner Rating	120	mmBTU/hr
Natural Gas Heating Value	1,050	mmBTU/mmcf
Asphalt Temperature	325	°F
Natural Gas	0.114	mmcf/hr
	0.762	mmcf/day
	125.714	mmcf/yr

Source	(ton/hr)	(tons/day)	(tons/yr)	Pollutant	Emission Factor* (lbs/ton)	Cyclone Control Efficiency	Baghouse Control Efficiency	Emissions (lbs/hr)	Emissions Maximum (lbs/day)	Emissions (tons/yr)
Parallel Flow Drum Mixer, 120 mBtu/hr, Fired on Natural Gas	300	2,000	330,000	PM_{10}	0.0230	50%	99.0%	6.90	46.00	3.80
				VOC	0.0320	0%	95.0%	9.60	64.00	5.28
				NOx	0.0260	0%	0.0%	7.80	52.00	4.29
				CO	0.1300	0%	0.0%	39.00	260.00	21.45
				SO_2	0.0034	0%	0.0%	1.02	6.80	0.56

*From Hot Mix Asphalt Plants Emission Estimation Report, EPA-454/R-00-019, December, 2000.

Description	(mmcf/hr)	(mmcf/day)	(mmcf/yr)	Pollutant	Emission Factor (kg/mmBTU)	Conversion Factor (mmBTU/mmcf)	GWP	Emissions (mtons/hr)	Emissions Maximum (mtons/day)	Emissions (mtons/yr)
Parallel Flow Drum Mixer, 120 mBtu/hr, Fired on Natural Gas	0.1143	0.7619	125.71	CO2	53.02	1050	1	6.36	42.42	6,998.64
				CH4	1.00E-03	1050	21	0.00	0.02	2.77
				N2O	1.00E-04	1050	310	0.00	0.02	4.09
									TOTAL	7,005.50

Source	(ton/hr)	(tons/day)	(tons/yr)	Pollutant	Emission Factor (lbs/ton)	Blue Smoke Fiber Bed Filter Control Efficiency	Emissions (lbs/hr)	Emissions Maximum (lbs/day)	Emissions (tons/yr)
Silo Loading	300	2,000	330,000	PM-10	0.00059	0%	0.18	1.17	0.10
				CO	0.00118	0%	0.35	2.36	0.19
				VOCs	0.01219	0%	3.66	24.37	2.01

Source	(ton/hr)	(tons/day)	(tons/yr)	Pollutant	Emission Factor (lbs/ton)	Blue Smoke Fiber Bed Filter Control Efficiency	Emissions (lbs/hr)	Emissions Maximum (lbs/day)	Emissions (tons/yr)
Plant Load Out	300	2,000	330,000	PM-10	0.00052	0%	0.16	1.04	0.09
				CO	0.00135	0%	0.40	2.70	0.22
				VOCs	0.00391	0%	1.17	7.82	0.65

Hot Oil Heater Emissions

Burner Rating	1.2	mmBTU/hr
Natural Gas Heating Value	1,020	mmBTU/mmcf
Natural Gas	0.0012	mmcf/hr
	0.0235	mmcf/day
	0.7059	mmcf/month
	8.4706	mmcf/yr

							Emissions		
Description	(mmcf/hr)	(mmcf/day)	(mmcf/yr)	Pollutant	Emission Factor (lbs/mmcf)	Control Efficiency	(lbs/hr)	Maximum (lbs/day)	(tons/yr)
Hot Oil Heater, CEI-2400G, 1.2 mBtu/hr, Fired on Natural Gas	0.0012	0.0235	8.47	NO_x	25.52	0%	0.03	0.60	0.11
				CO	310.69	0%	0.37	7.31	1.32
				SO_2	0.6	0%	0.00	0.01	0.00
				VOC	7	0%	0.01	0.16	0.03
				PM10	7.5	0%	0.01	0.18	0.03

					Emission Factor	Conversion Factor		Emissions		
Description	(mmcf/hr)	(mmcf/day)	(mmcf/yr)	Pollutant	(kg/mmBTU)	(mmBTU/mmcf)	GWP	(mtons/hr)	Maximum (mtons/day	(mtons/yr)
Hot Oil Heater, CEI-2400G, 1.2 mBtu/hr, Fired on Natural Gas	0.0012	0.0235	8.47	CO2	53.02	1020	1	0.06	1.27	458.09
				CH4	1.00E-03	1020	21	0.00	0.00	0.18
				N2O	1.00E-04	1020	310	0.00	0.00	0.27
									TOTAL	458.54

Asphalt Oil Storage Tank Emissions: Uncontrolled

Assumptions

Asphalt Oil % in mix:	5.0%	
Total Oil Used	16,500	tons/yr
Hot Oil Density	9.174	lbs/gal
Total Oil Used	3,597,122	gal/yr
Tank Capacity	30,000	gal
Turnovers	119.9041	per year (assumed 50% went though each tank)

Emissions

Working Loss	541.33	lbs/yr
Breathing Loss	242.66	lbs/yr
Total	783.98	lbs/yr per tank
Condenser Control	0%	
Controlled Emissions	783.9831	lbs/yr
Hourly Emissions	0.002376	lbs/hr
Maximum Daily Emissions	4.751413	lbs/day

Associates Environmental

Section 2

Controlled Emissions Calculations

Hot Mix Asphalt Plant: Cold Feed System Controlled Emission Calculations

Below are the estimated PM10 emissions from the aggregate/RAP systems. Emissions factors were obtained from AP-42, Table 11.19.2-2 to estimate the PM10 emissions.

Maximum Asphalt Processed	300	tons/hr
	2,000	tons/day
	330,000	tons/yr

Hourly Emissions

Description	Material	Production (tons/hr)	x	AP42^ PM10 Emission Factor (lbs/tons)	x	=	PM10 Emissions (lbs/hr)	
Bins Feeding	Aggregate	142.50		0.000046			0.01	
Conveyors BF1 - BF5	Aggregate	142.50		0.000046			0.01	
Conveyor CC	Aggregate	142.50		0.000046			0.01	
Scalping Screen	Aggregate	142.50		0.00074			0.11	
Conveyor BC1	Aggregate	142.50		0.000046			0.01	
Bins Feeding	RAP	142.50		0.000046			0.01	
Conveyors RF1 - RF2	RAP	142.50		0.000046			0.01	
Conveyor RCC	RAP	142.50		0.000046			0.01	
Conveyor RC1	RAP	142.50		0.000046			0.01	
2-Deck Screen	RAP	142.50		0.00074			0.11	
HSI Crusher	RAP	142.50		0.00054			0.08	
Conveyor RC2	RAP	142.50		0.000046			0.01	
Conveyor RC3	RAP	142.50		0.000046			0.01	
					Total		0.35	lbs/hr

^Control emission factors utilized for water control. Emission factors obtained from AP42 Chapter 11.19.2, Table 11.19.2-2. Please Refer to Appendix B.

Daily Emissions

Description	Material	Production (tons/day)	x	AP42^ PM10 Emission Factor (lbs/tons)	x	=	PM10 Emissions (lbs/day)	
Bins Feeding	Aggregate	1,425.00		0.000046			0.07	
Conveyors BF1 - BF5	Aggregate	1,425.00		0.000046			0.07	
Conveyor CC	Aggregate	1,425.00		0.000046			0.07	
Scalping Screen	Aggregate	1,425.00		0.00074			1.05	
Conveyor BC1	Aggregate	1,425.00		0.000046			0.07	
Bins Feeding	RAP	475.00		0.000046			0.02	
Conveyors RF1 - RF2	RAP	475.00		0.000046			0.02	
Conveyor RCC	RAP	475.00		0.000046			0.02	
Conveyor RC1	RAP	475.00		0.000046			0.02	
2-Deck Screen	RAP	475.00		0.00074			0.35	
HSI Crusher	RAP	475.00		0.00054			0.26	
Conveyor RC2	RAP	475.00		0.000046			0.02	
Conveyor RC3	RAP	475.00		0.000046			0.02	
					Total		2.06	lbs/day

^Control emission factors utilized for water control. Emission factors obtained from AP42 Chapter 11.19.2, Table 11.19.2-2. Please Refer to Appendix B.

Annual Emissions

Description	Material	Production (tons/yr)	x	AP42^ PM10 Emission Factor (lbs/tons)	x	=	PM10 Emissions (lbs/yr)	
Bins Feeding	Aggregate	235,125		0.000046			10.82	
Conveyors BF1 - BF5	Aggregate	235,125		0.000046			10.82	
Conveyor CC	Aggregate	235,125		0.000046			10.82	
Scalping Screen	Aggregate	235,125		0.00074			173.99	
Conveyor BC1	Aggregate	235,125		0.000046			10.82	
Bins Feeding	RAP	78,375		0.000046			3.61	
Conveyors RF1 - RF2	RAP	78,375		0.000046			3.61	
Conveyor RCC	RAP	78,375		0.000046			3.61	
Conveyor RC1	RAP	78,375		0.000046			3.61	
2-Deck Screen	RAP	78,375		0.00074			58.00	
HSI Crusher	RAP	78,375		0.00054			42.32	
Conveyor RC2	RAP	78,375		0.000046			3.61	
Conveyor RC3	RAP	78,375		0.000046			3.61	
					Total		339.21	
							0.17	tons/yr

^Control emission factors utilized for water control. Emission factors obtained from AP42 Chapter 11.19.2, Table 11.19.2-2. Please Refer to Appendix B.

Hot Mix Asphalt Emissions: Controlled Asphalt Drum Dryer, Silo Loading and Asphalt Load Out Emissions

Burner Rating	120	mmBTU/hr
Natural Gas Heating Value	1,050	mmBTU/mmcf
Asphalt Temperature	325	°F
Natural Gas	0.11428571	mmcf/hr
	0.76190476	mmcf/day
	125.714286	mmcf/yr

Source	(ton/hr)	(tons/day)	(tons/yr)	Pollutant	Emission Factor* (lbs/ton)	Cyclone Control Efficiency	Baghouse Control Efficiency	Emissions (lbs/hr)	Emissions Maximum (lbs/day)	Emissions (tons/yr)
Parallel Flow Drum Mixer, 120 mBtu/hr, Fired on Natural Gas	300	2,000	330,000	PM_{10}	0.0046	50%	99.0%	1.37	9.15	0.76
				VOC	0.0042	0%	95.0%	1.26	8.41	0.69
				NOx	0.0095	0%	0.0%	2.85	18.98	1.57
				CO	0.0436	0%	0.0%	13.07	87.12	7.19
				SO_2	0.0021	0%	0.0%	0.62	4.14	0.34

*Emission Factors are taken from a source test performed on a similar facility.

Description	(mmcf/hr)	(mmcf/day)	(mmcf/yr)	Pollutant	Emission Factor (kg/mmBTU)	Conversion Factor (mmBTU/mmcf)	GWP	Emissions (mtons/hr)	Emissions Maximum (mtons/day)	Emissions (mtons/yr)
Parallel Flow Drum Mixer, 120 mBtu/hr, Fired on Natural Gas	0.1143	0.7619	125.71	CO2	53.02	1050	1	6.36	42.42	6,998.64
				CH4	1.00E-03	1050	21	0.00	0.02	2.77
				N2O	1.00E-04	1050	310	0.00	0.02	4.09
									TOTAL	7,005.50

Source	(ton/hr)	(tons/day)	(tons/yr)	Pollutant	Emission Factor (lbs/ton)	Blue Smoke Fiber Bed Filter Control Efficiency	Emissions (lbs/hr)	Emissions Maximum (lbs/day)	Emissions (tons/yr)
Silo Loading	300	2,000	330,000	PM-10	0.00059	90%	0.02	0.12	0.01
				CO	0.00118	0%	0.35	2.36	0.19
				VOCs	0.01219	90%	0.37	2.44	0.20

Source	(ton/hr)	(tons/day)	(tons/yr)	Pollutant	Emission Factor (lbs/ton)	Blue Smoke Fiber Bed Filter Control Efficiency	Emissions (lbs/hr)	Emissions Maximum (lbs/day)	Emissions (tons/yr)
Plant Load Out	300	2,000	330,000	PM-10	0.00052	90%	0.02	0.10	0.01
				CO	0.00135	0%	0.40	2.70	0.22
				VOCs	0.00416	90%	0.12	0.83	0.07

Hot Oil Heater Emissions

Burner Rating	1.2	mmBTU/hr
Natural Gas Heating Value	1020	mmBTU/mmcf
Natural Gas	0.0012	mmcf/hr
	0.0235	mmcf/day
	0.7059	mmcf/month
	8.4706	mmcf/yr

Description	(mmcf/hr)	(mmcf/day)	(mmcf/yr)	Pollutant	Emission Factor (lbs/mmcf)	Control Efficiency	Emissions (lbs/hr)	Maximum (lbs/day)	(tons/yr)
Hot Oil Heater, CEI-2400G, 1.2 mBtu/hr, Fired on Natural Gas	0.0012	0.0235	8.47	NO_x	25.52	0%	0.03	0.60	0.11
				CO	310.69	0%	0.37	7.31	1.32
				SO_2	0.6	0%	0.00	0.01	0.00
				VOC	7	0%	0.01	0.16	0.03
				PM10	7.5	0%	0.01	0.18	0.03

Description	(mmcf/hr)	(mmcf/day)	(mmcf/yr)	Pollutant	Emission Factor (kg/mmBTU)	Conversion Factor (mmBTU/mmcf)	GWP	Emissions (mtons/hr)	Maximum (mtons/day	(mtons/yr)
Hot Oil Heater, CEI-2400G, 1.2 mBtu/hr, Fired on Natural Gas	0.0012	0.0235	8.47	CO2	53.02	1020	1	0.06	1.27	458.09
				CH4	1.00E-03	1020	21	0.00	0.00	0.18
				N2O	1.00E-04	1020	310	0.00	0.00	0.27
									TOTAL	458.54

Asphalt Oil Storage Tank Emissions: Controlled

Assumptions

Asphalt Oil % in mix:	5.0%	
Total Oil Used	16,500	tons/yr
Hot Oil Density	9.174	lbs/gal
Total Oil Used	3,597,122	gal/yr
Tank Capacity	30,000	gal
Turnovers	119.9041	per year

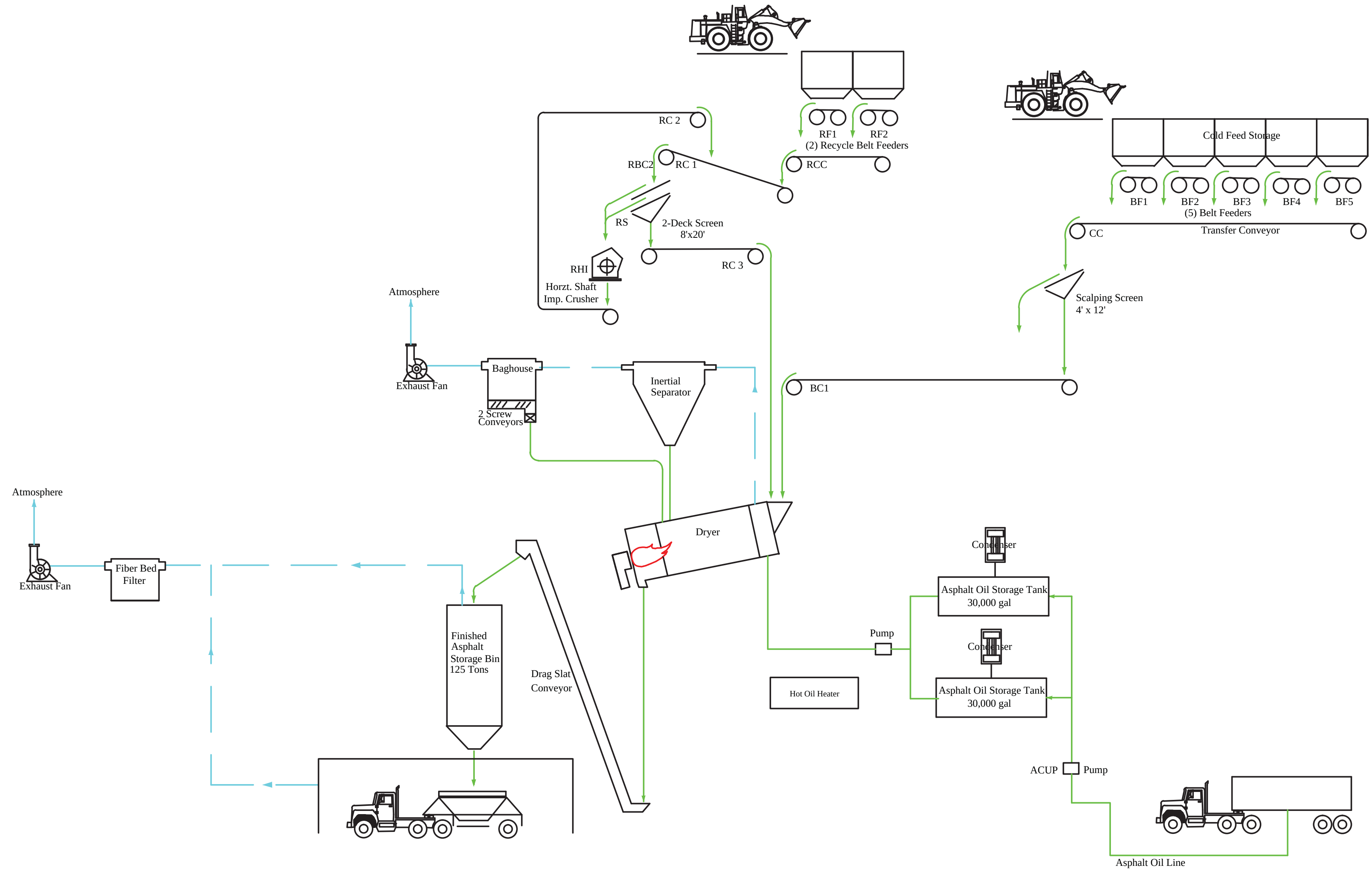
Emissions

Working Loss	541.33	lbs/yr
Breathing Loss	242.66	lbs/yr
Total	783.98	lbs/yr
Condenser Control	90%	
Controlled Emissions	78.40	lbs/yr
Hourly Emissions	0.000238	lbs/hr
Maximum Daily Emissions	0.475141	lbs/day

Associates Environmental

Appendix A

Flow Diagram



Air Flow	
Material Flow	

Associates Environmental

Associates Environmental

16882 Bolsa Chica St. Suite 202
Huntington Beach, CA 92649
(714) 916-4953 Fax (714) 362-9085

Description

Secondary Description	Scale
Flow Diagram	

Job No.	Drawing Date	Drawn By:	Drawing Version
		RF	1.0

Associates Environmental

Appendix B

AP-42, Chapter 11.19.2, Table 11.19.2-2

Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

Source [b]	Total Particulate Matter [r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Primary Crushing (controlled) (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Secondary Crushing (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Secondary Crushing (controlled) (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Tertiary Crushing (SCC 3-050030-03)	0.0054[d]	E	0.0024[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0012[d]	E	0.00054[p]	C	0.00010[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0390[e]	E	0.0150[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0030[f]	E	0.0012[f]	E	0.000070[q]	E
Screening (SCC 3-05-020-02, 03)	0.025[c]	E	0.0087[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0022[d]	E	0.00074[m]	C	0.000050[q]	E
Fines Screening (SCC 3-05-020-21)	0.30[g]	E	0.072[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0036[g]	E	0.0022[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0030[h]	E	0.00110[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014[i]	E	4.6×10^{-5}[i]	D	1.3×10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0×10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6×10^{-5}[j]	E	ND	
Truck Loading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		0.00010[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

e. Reference 4

f. References 4 and 15

g. Reference 4

h. References 5 and 6

i. References 5, 6, and 15

j. Reference 11

k. Reference 12

l. References 1, 3, 7, and 8

m. References 1, 3, 7, 8, and 15

n. No data available, but emission factors for PM-10 for tertiary crushers can be used as an upper limit for primary or secondary crushing

o. References 2, 3, 7, 8

p. References 2, 3, 7, 8, and 15

q. Reference 15

r. PM emission factors are presented based on PM-100 data in the Background Support Document for Section 11.19.2

s. Emission factors for PM-30 and PM-50 are available in Figures 11.19.2-3 through 11.19.2-6.

Note: Truck Unloading - Conveyor, crushed stone (SCC 3-05-020-32) was corrected to Truck Loading - Conveyor, crushed stone (SCC 3-05-020-32). October 1, 2010.

.

Associates Environmental

Appendix C

Hot Mix Asphalt Plants Emission Estimate Report

United States Environmental Protection Agency
Office Of Air Quality Planning And Standards
Research Triangle Park, NC 27711
EPA-454/R-00-019
December 2000

Air

HOT MIX ASPHALT PLANTS

EMISSION ASSESSMENT REPORT

TABLE 2. ESTIMATED ANNUAL EMISSIONS FOR A TYPICAL DRUM MIX HMA FACILITY[a]

Pollutant	Annual emissions by source, pounds per year									
	Mobile sources (diesel exhaust)	Material handling and road dust	No. 2 fuel oil-fired dryer[b]	Natural gas-fired dryer[c]	Load-out[d]	Silo filling[e]	Asphalt storage[f]	Yard[g]	Total[h] (oil-fired)	Total[h] (gas-fired)
Criteria air pollutants										
Particulate matter less than 10 micrometers (PM-10)	220	26,000	4,600	4,600	104	117			31,000	31,000
Volatile organic compounds (VOC)	190		6,400	6,400	782	2,440	64	220	10,000	10,000
Carbon monoxide (CO)	1,200		26,000	26,000	270	236	6	72	28,000	28,000
Sulfur dioxide (SO_2)	26		2,200	680					2,200	710
Nitrogen oxides (NO_x)	560		11,000	5,200					12,000	5,800
Hazardous air pollutants (HAPs)										
Polycyclic aromatic hydrocarbons (PAHs)	0.13		176	37	4.0	5.8	0.12		190	50
Phenol					0.80				0.80	0.80
Volatile HAPs	6.6		1,560	1,020	12.4	31	140	3.3	1,800	1,200
Metal HAPs			19	16					19	16
Total HAPs[h]	6.7		1,800	1,100	17	37	140	3.3	2,000	1,300

[a] Based on an annual HMA production rate of 200,000 tons per year.
[b] Between 10 and 30 percent of the HMA is produced using fuel oil.
[c] Between 70 and 90 percent of the HMA is produced using natural gas.
[d] Loading of HMA into haul trucks
[e] Filling of temporary storage silo prior to load-out.
[f] Includes emissions from oil-fired hot oil heaters.
[g] Fugitive emissions from loaded trucks prior to departure to the job site.
[h] Total expressed using two significant figures.

Associates Environmental

Appendix D

Hot Mix Asphalt Plant Source Test Report

SUMMARY OF SOURCE TEST RESULTS

BAGHOUSE EXHAUST

Sample Location RUN #	Outlet 1	Outlet 2	Outlet 3	Outlet 4	Averages
CONSTITUENT					
Oxides of Nitrogen					
ppmv	13.6	-	14.6	12.5	13.6
ppmv @ 3% O2	27	-	28	23	26
lb/hr	2.91	-	3.05	2.45	2.80
Carbon Monoxide					
ppmv	113	-	98	95	102
ppmv @ 3% O2	227	-	189	177	198
lb/hr	14.71	-	12.47	11.36	12.85
Oxygen, %	12.0	11.6	11.6	11.3	11.7
Stack Flowrate, dscfm	29416	28773	27019	28403	28403
Moisture, %	23.6	24.0	24.1	-	23.9
Total Particulate					
gr/dscf	0.0039	0.0052	0.0077	-	0.0056
lb/hr	0.98	1.29	1.79	-	1.35 ÷ 295 TPH = 4.57E-3 lb/…
Sulfur Dioxide					
ppmv	9.1	6.7	8.2	-	8.0
lb/hr	0.72	0.52	0.60	-	0.61 ÷ 295 TPH = 2.06E-3 lb/ton
Total Nonmethane Hydrocarbons					
ppmv, as CH4	24	9	19	-	17
ppmv @ 3% O2, as CH4	48	17	35	-	33
lb/hr, as CH4	1.79	0.63	1.29	-	1.24 ÷ 295 TPH = 4.20 E-3 lb/ton
Total Production Rate, TPH	299	287	300	-	295
RAP Production, TPH	94.9	71.3	82.3	-	82.8

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T1
City:	Corona
State:	California
Company:	Mayhew Aggregates & Mine Reclamation
Type of Tank:	Horizontal Tank
Description:	Asphalt Oil Tank

Tank Dimensions

Shell Length (ft):	51.00
Diameter (ft):	10.00
Volume (gallons):	30,000.00
Turnovers:	119.90
Net Throughput(gal/yr):	3,597,122.00
Is Tank Heated (y/n):	Y
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T1 - Horizontal Tank
Corona, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ashpalt Oil	All	350.00	300.00	400.00	350.00	0.1805	0.0532	0.5309	84.0000			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T1 - Horizontal Tank
Corona, California

Annual Emission Calcaulations	
Standing Losses (lb):	242.6563
Vapor Space Volume (cu ft):	2,551.2934
Vapor Density (lb/cu ft):	0.0017
Vapor Space Expansion Factor:	0.1565
Vented Vapor Saturation Factor:	0.9544
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,551.2934
Tank Diameter (ft):	10.0000
Effective Diameter (ft):	25.4889
Vapor Space Outage (ft):	5.0000
Tank Shell Length (ft):	51.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0017
Vapor Molecular Weight (lb/lb-mole):	84.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1805
Daily Avg. Liquid Surface Temp. (deg. R):	809.6700
Daily Average Ambient Temp. (deg. F):	62.9500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	809.6700
Tank Paint Solar Absorptance (Shell):	0.3900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,594.0000
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1565
Daily Vapor Temperature Range (deg. R):	100.0000
Daily Vapor Pressure Range (psia):	0.4777
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1805
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0532
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5309
Daily Avg. Liquid Surface Temp. (deg R):	809.6700
Daily Min. Liquid Surface Temp. (deg R):	759.6700
Daily Max. Liquid Surface Temp. (deg R):	859.6700
Daily Ambient Temp. Range (deg. R):	14.8500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9544
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.1805
Vapor Space Outage (ft):	5.0000
Working Losses (lb):	541.3268
Vapor Molecular Weight (lb/lb-mole):	84.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.1805
Annual Net Throughput (gal/yr.):	3,597,122.0000
Annual Turnovers:	119.9041
Turnover Factor:	0.4169
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	783.9832

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

T1 - Horizontal Tank
Corona, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Ashpalt Oil	541.33	242.66	783.98

Appendix E

EPA TANKS 4.09d Report