Appendix L

Air Quality and Greenhouse Gas Emissions Technical Report

Boca Quarry Expansion Project

Air Quality and Greenhouse Gas Emissions Technical Report

Prepared for:

Nevada County
Community Development Agency
950 Maidu Avenue, Suite 170-CDA
Nevada City, CA 95959

Prepared by:

HELIX Environmental Planning, Inc.
11 Natoma Street, Suite 155
Folsom, CA 95630

April 2019 | NCO-01

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ACRONYMS AND ABBREVIATIONS

AAQS	ambient air quality standard
AB	Assembly Bill
ADT	average daily trip
AMSL	above mean sea level
ANFO	ammonium nitrate fuel oil
APCD	Air Pollution Control District
AQMP	air quality management plan
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emission Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbon
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2-equivalent
County	County of Nevada
CH_4	methane
cy	cubic yards
DPM	diesel particulate matter
EO	Executive Order
F	Farenheit
FR	Forest
ft	feet
GHG	greenhouse gases
g/l	grams per liter
GWP	Global Warming Potential
H_2S	hydrogen sulfide
HAP	Hazardous Air Pollutant
HFC	hydrofluorocarbon
HI	Hazard Index

ACRONYMS AND ABBREVIATIONS (cont.)

IPCC	Intergovernmental Panel on Climate Change
kWh	kilowatt hours
lbs/day	pounds per day
LCFS	Low Carbon Fuel Standard
LOS	level of service
m	meters
MCAB	Mountain Counties Air Basin
ME	Mineral Extraction
MMT	million metric tons
mg/m^3	milligrams per cubic meter
$\mu g/m^3$	micrograms per cubic meter
mpg	miles per gallon
mph	miles per hour
m/s	meters per seconds
MT	metric tons
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NHTSA	National Highway Traffic Safety Administration
NOAA	National Oceanic and Atmospheric Administration
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSAQMD	Northern Sierra Air Quality Management District
O_3	ozone
OAP	ozone attainment plan
OEHHA	Office of Environmental Health Hazard Assessment
Pb	lead
PFC	perfluorocarbon
PM	particulate matter
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
ppb	parts per billion
ppm	parts per million
ROG	reactive organic gas

ACRONYMS AND ABBREVIATIONS (cont.)

SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
SO_X	sulfur oxides
TACs	toxic air contaminants
T-BACT	Toxics Best Available Control Technology
TIA	Traffic Impact Analysis
URF	Unit Risk Factor
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
VMT	vehicle miles traveled
VOC	volatile organic compounds

EXECUTIVE SUMMARY

This report presents an assessment of potential air quality and greenhouse gas (GHG) emission impacts associated with the proposed Boca Quarry Expansion Project (project). The evaluation addresses the potential for air pollutant and GHG emissions during construction of the off-site roadway improvement, site preparation, and operation of the project. Project operation includes an assessment of the potential for criteria pollutants and GHG emissions due to the aggregate mining process (including blasting), processing plant operations, and off- and on-site traffic (including haul truck and employee vehicle travel).

During the next 30 years of average production operations, the total aggregate materials mined could reach a maximum of 17 million tons. However, it may take several years before full annual production is reached and although the quarry could be at full production in a given year, it may not operate at full production the next year. This assumption results in three scenarios. Scenario 1, *Peak Daily Production*, analyzes peak production based on a typical workday (12 hours per day for approximately 180 working days) production of 4,100 tons per day, yielding approximately 738,000 tons per year. Scenario 2, *Worst-Case Production*, analyzes the worst-case daily production of 10,080 tons per day based on the maximum number of trucks able to be managed on-site and would yield approximately 93 working days. Scenario 3, *Average Daily Production*, assumes an average production of approximately 3,170 tons per day yielding 570,000 tons per year based on a normal 8 hours per day work shift for approximately 180 working days. These three production scenarios were analyzed for the operation of the project.

Operational emissions include emissions associated with fugitive dust, heavy off-road equipment, blasting emissions, workers' commutes, haul truck trips to and from the site, and seasonal burning of stripped vegetation. All operational activities, including reclamation, are assumed to occur in an overlapping schedule in three phases for approximately 30 years, with reclamation continuing 5 years after mining operations cease. Site distance and bicycle safety road improvements would occur over a 1.3-mile segment of Stampede Meadows Road and would include widening the road and constructing three vehicle pullout areas. The impact associated with the operational activities and off-site roadway improvement construction for air quality pollutants would be significant for NO_X and PM_{10} emissions.

Asbestos may be present in the project site and off-site roadway improvement area. Ground disturbing activities may release asbestos into the air which would be a potentially significant impact. Mitigation would reduce the impacts to less than significant. All other criteria pollutant and air toxic contaminants would be less than significant.

GHG emissions associated with the project would result in a nominal increase in GHG emissions when compared to the baseline scenario of hauling aggregate from more distant locations. Greenhouse gas emissions do not have thresholds under the Northern Sierra Air Quality Management District (NSAQMD), however, they are provided for informational purposes. Mitigation measures were required for this project; however, it is not enough to reduce the impact of NO_X and PM_{10} emissions to less than significant.

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1.0 INTRODUCTION

1.1 PURPOSE

This report presents an assessment of potential air quality and greenhouse gas (GHG) impacts associated with the proposed Boca Quarry Expansion Project, which includes (1) modification of the Boca Quarry site plan to accommodate additional mining, blasting activities, and processing on both the currently permitted parcel (Assessor's Parcel Number [APN] 48-090-12) and the adjacent parcel (APN 48-200-03); and, (2) amendment of the existing Reclamation Plan to correspond with the proposed mine expansion and the importation of clean fill material for pit backfilling. This air quality and GHG analysis technical report includes an (1) evaluation of project operations, including quarry blasting and mining, processing plant emissions, and off- and on-site mobile emissions; (2) emissions associated with the off-site roadway improvement construction; and (3) a baseline scenario comparison of avoided haul truck GHG emissions. The analysis of impacts is based on state and federal ambient air quality standards and impacts are assessed in accordance with the guidelines, policies, and standards established by the Northern Sierra Air Quality Management District (NSAQMD). Project compatibility with the state implementation plan is also assessed. Measures are recommended, as required, to reduce potentially significant impacts. GHG emissions are quantified and assessed for informational purposes as there are no thresholds established by the NSAQMD.

1.2 PROJECT LOCATION

The proposed project is located on a 230-acre site on two parcels in the eastern portion of Nevada County on Assessor Parcel Numbers (APN) 48-090-12 and 48-200-03; project activities would occur on a 158-acre subset of the two parcels. The project site is located approximately 7 miles northeast of the Town of Truckee. Figures 1 and 2 (*Regional Location Map* and *Regional Setting Map,* respectively) present the project location and setting of the project site.

1.3 EXISTING SITE CONDITIONS

Activities at the project site currently include mining, blasting, processing, and transportation of crushed rock from the project site to off-site construction markets. The site is currently an excavated slope and quarry floor, with steep surrounding topography. Elevations at the project site range from about 6,200 feet above mean sea level (AMSL) at the northern end of the site, to approximately 5,700 AMSL at the southern end of the site. A spring water collection facility, a cellular antenna site, and a timber production facility exist in the project vicinity.

1.4 PROJECT DESCRIPTION

The Boca Quarry is an approximately 230-acre site. The proposed project would increase the existing approximately 40-acre extraction/disturbance area in the East Pit to a total area of approximately 158 acres, an increase of 118 acres. The proposed additional 118-acre extraction area is the West Pit. The project site would include the East and West Pit mining areas, as depicted in Figure 3 (Aerial Map). The existing operations in the East Pit include the permitted excavation area, an aggregate processing area, scale, office, and ancillary facilities, which would remain in use for the duration of the operation period. The proposed expanded quarry operation would continue to use the existing haul route for the permitted quarry operations, which includes West Hinton Road from the quarry to Stampede Meadows

Road, and Stampede Meadows Road south to I-80. The proposed project includes site distance and bicycle safety improvements along an approximately 1.3-mile long segment of Stampede Meadows Road and would be a maximum area of 22 acres of ground disturbance.

The total project area includes the entire 230-acre Boca Quarry (project site) and off-site roadway improvement area. Therefore, potential new ground disturbance within the project area would total up to 140 acres, which would include 118 acres of new ground disturbance in the West Pit and a maximum of 22 acres of ground disturbance associated with the roadway improvements.

1.5 OPERATIONS OVERVIEW

1.5.1 Phasing, Mining and Processing

Mining for the proposed project would occur in three phases: under Phase I, the existing permitted mining operations in the East Pit would continue and Phases II and III would involve mining the West Pit. During Phase II, the lower (southern) portion of the West Pit would be mined to its maximum width and depth. The upper ridge of the West Pit would then be mined during Phase III, and the overburden from the ridge would be moved to the lower area to be used as backfill in the lower pit, which would allow concurrent, partial reclamation of the lowest bench in the Phase II area. Refer to Figure 4 for the proposed phasing and mine plan.

Before the desired hardrock could be extracted, the overlaying overburden and vegetation would first be removed during site preparation. The overburden and vegetation would be removed in increments to provide enough cleared ground for between one week to one year of production. Saleable logs would be removed from the site and the remaining stripped vegetation would be stored in piles and burned in accordance with air district regulations, typically in the late fall/early winter. Actual aggregate mining would occur in a multi-step process which includes drilling, blasting, and excavation with the use of heavy equipment. After blasting activities, haul trucks would be loaded full of aggregate material for transportation to the crusher at the East Pit processing plant. Primary crushing of rock fragments too large for transportation to the East Pit processing plant would occur in the active West Pit mining area. Overburden would either be stockpiled or loaded into haul trucks for backfilling and/or concurrent reclamation of final configuration surfaces. These backfill materials (combined with imported backfill) would be used to backfill Phase II's lower pit.

Aggregate material loosened from the West Pit would be taken to the processing plant in the East Pit for screening and crushing, and then it would be stockpiled for shipping. Processing to create construction aggregate products involves only crushing and screening of sorted graded materials. Materials mined from the West Pit would be taken to the materials processing facility operated in the East Pit for screening and crushing and would then be stockpiled for sale and export. The maximum daily quarry production is limited by the rate at which trucks can be loaded and leave the site; therefore, the estimated maximum daily production is 10,080 tons. Annual processing operations are proposed to occur at the same rate as the mining operations, averaging 570,000 tons per year. Over 30 years, the lifetime of Boca Quarry, this translates to an expected maximum production of 17 million tons of aggregate.

During the next 30 years of average production operations, the total aggregate materials mined could reach a maximum of 17 million tons. However, it may take several years before full annual production is

reached and although the quarry could be at full production in a given year, it may not operate at full production the next year. As such, three production scenarios were analyzed for mining operations;

- Scenario 1, *Peak Daily Production*, analyzes peak production based on a typical workday (12 hours per day for approximately 180 working days) production of 4,100 tons per day, yielding approximately 738,000 tons per year.

- Scenario 2, *Worst-Case Daily Production*, analyzes the worst-case daily production of 10,080 tons per day based on the maximum number of trucks able to be managed on-site. This scenario assumes equipment is operating continuously for 16 hours with load-out occurring up to 24 hours per day, six days a week, yielding a maximum 10,080 tons per day. The maximum annual production of 1,000,000 tons would yield approximately 93 working days under this scenario.

- Scenario 3, *Average Daily Production*, assumes an average production of approximately 3,170 tons per day yielding 570,000 tons per year based on a normal 8 hours per day work shift for approximately 180 working days.

1.5.2 Reclamation

Under the Amended Reclamation Plan, mining and reclamation would be concurrent activities throughout the life of the quarry, and the implementation of reclamation would be timed to allow maximum extraction of salable resources from both pits for the life of the mine. Because the processing plant in the East Pit would continue to operate for the duration of the life of the West Pit, final reclamation of this portion of the East Pit would be delayed until the end of the entire project life. Implementation and monitoring of final reclamation activities would be completed within five years after the completion of mining.

Resoiling would occur on both the wide Phase II pit floors (once backfilling is completed) and the narrow benches separating the Phase III highwalls of the West Pit. Additional clean backfill from construction sites outside the project site may be imported to supplement backfill operations and to provide a suitable plant growth medium to supplement the salvaged topsoil. Following soil placement, native grasses, shrubs and trees would be broadcast seeded and revegetation of the final surface is intended to consist of vegetation types and species similar to the vegetation currently existing on the project site.

Following completion of mining and reclamation activities, mobile equipment associated with the mining operation would be removed from the site, as well as stationary equipment including, but not limited to, the office building, scale, screens and conveyors.

1.5.3 Operating Schedule and Workforce

The plant would operate, on a single-shift basis from May 1 until October 31, six days per week (total of 158 operating days minus any holidays). Based upon market demand or emergency needs such as urgent response to flood events, the quarry may open earlier or continue operations later than the dates stated above but would not exceed 180 operating days per year. Mining, processing, sales, and truck transport from the site would generally take place between 6 a.m. and 6 p.m., Monday through Friday, and between 7 a.m. and 4 p.m. on Saturday. Occasionally, customer demand and/or operational considerations may dictate periods of extended hours which can involve two shifts and result in

operating hours starting at 5 a.m. and ending as late as 9 p.m. Certain public agency projects (such as Caltrans road improvement projects) may operate during nighttime hours to prevent traffic congestion associated with lane closures and heavy vehicle operations, in addition to road repairs made necessary by natural disasters (e.g. flooding) or other unforeseen events. These road improvement or repair projects accordingly require materials to be supplied at night. The only operation allowed after 9 p.m. and before 6 a.m. is material loadout. Loadout could occur 24 hours per day and up to seven days per week for limited periods in order to service these projects. The duration of these expanded hours of operation would depend on the duration of the projects being supplied.

1.5.4 Utilities

The project site is already connected to electrical power provided by Liberty Energy-CalPeco, and no back-up electricity generation would be required under the proposed project. An existing on-site spring in the southern portion of the project site currently provides water for dust control during the aggregate processing operation and would continue to do so under the proposed project.

1.6 OFF-SITE ROADWAY IMPROVEMENTS OVERVIEW

The project would include a maximum of 22 acres ground disturbance associated with the 1.3-mile long segment of Stampede Meadows Road. Site distance and bicycle safety improvements would be made to address concerns regarding bicyclist safety and visibility deficiencies at the intersection of Stampede Meadows Road with West Hinton Road.

The proposed improvements would extend from approximately 500 feet north of West Hinton Road to approximately 1.2 miles south of West Hinton Road. The improvements include pavement widening and shoulder improvements along the roadway segment and sight distance improvements at the Stampede Meadows Road and West Hinton Road intersection to provide adequate driver sight distance. The road would be widened from 20- to 24-foot wide pavement to 32-feet wide and would include providing a 1-foot wide dirt shoulder along the entire length. In addition, vehicle pullout areas would be constructed at three locations along the segment. To address sight distance improvements, two areas totaling approximately 29,200 square feet, (one of 14,100 square feet and one of 15,100 square feet), would be cleared of vegetation and large trees and graded to remove site obstructions. The improved areas would be revegetated following construction.

Construction of the sight distance and bicycle safety improvements would likely occur in phase. However, construction would consist of the following anticipated phases of construction that may overlap: 1) excavation, 2) AB (aggregate base rock), and 3) AC (asphaltic concrete paving).

Road improvement construction would likely occur Monday through Saturday from 7:00 a.m. to 3:30 p.m. and would only occur on Sundays in emergency. The construction crew would likely be based out of Teichert Construction's Lincoln office. Most employees live in the Roseville and Rocklin area and although hotels may be provided for workers, it is assumed, as a worst-case scenario, that all employees commute from the Roseville and Rocklin area. Construction worker estimates (including a foreman for each crew) are as follows:

- Excavation Crew: 6 people
- AB Crew: 6 people
- AC Paving Crew: 10 people

Additional personnel on-site on a typical construction day include: project manager, project engineer, roadway inspector, and construction superintendent.

2.0 ENVIRONMENTAL SETTING

2.1 AIR QUALITY

Air quality laws and regulations generally divide air pollutants into two broad categories: "criteria air pollutants" and "toxic air contaminants." Criteria air pollutants are a group of common air pollutants regulated by the federal and state governments by means of ambient standards based on criteria regarding health and/or environmental effects of pollution. Toxic air contaminants (TACs) are often referred to as "non-criteria" air pollutants because ambient air quality standards have not been established for them. Under certain conditions, TACs may cause adverse health effects, including cancer and/or acute and chronic noncancerous effects. The following sections provide a description of relevant criteria air pollutants and toxic air contaminants.

2.1.1 Criteria Pollutants

Criteria pollutants are defined by state and federal law as a risk to the health and welfare of the general public. In general, air pollutants include the following compounds:

- Ozone (O_3)
- Reactive Organic Gases (ROGs) or Volatile Organic Compounds (VOCs)
- Carbon Monoxide (CO)
- Nitrogen Dioxide (NO_2)
- Respirable Particulate Matter and Fine Particulate Matter (PM_{10} and $PM_{2.5}$)
- Sulfur dioxide (SO_2)
- Lead (Pb)

The following specific descriptions of health effects for each of the air pollutants potentially associated with the project are based on information provided by the USEPA (2017a) and California Air Resources Board (CARB 2009).

Ozone. Ozone is considered a photochemical oxidant, which is a chemical that is formed when VOCs and NO_X, both by-products of fuel combustion, react in the presence of ultraviolet light. In Nevada County, the majority of ozone is being transported from the Sacramento area. In Eastern Nevada County, high seasonal and peak traffic volumes can have a significant impact on ozone nonattainment (Nevada County 1995). Ozone is considered a respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at greatest risk from exposure to ozone.

Reactive Organic Gases. ROGs (also known as VOCs) are compounds composed primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of ROGs. Other sources of ROGs include evaporative emissions from paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROGs, but rather by reactions of ROGs to form secondary pollutants such as ozone.

Carbon Monoxide. CO is a product of fuel combustion, and the main source of CO is from motor vehicle exhaust. CO is an odorless, colorless gas. CO affects red blood cells in the body by binding to hemoglobin and reducing the amount of oxygen that can be carried to the body's organs and tissues. CO can cause health effects to those with cardiovascular disease and can also affect mental alertness and vision.

Nitrogen Dioxide. NO_2 is also a by-product of fuel combustion and is formed both directly as a product of combustion and in the atmosphere through the reaction of nitrogen oxide (NO) with oxygen. NO_2 is a respiratory irritant and may affect those with existing respiratory illness, including asthma. NO_2 can also increase the risk of respiratory illness.

Respirable Particulate Matter and Fine Particulate Matter. Respirable particulate matter, or PM_{10}, refers to particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter, or $PM_{2.5}$, refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. Particulate matter in these size ranges have been determined to have the potential to lodge in the lungs and contribute to respiratory problems. PM_{10} and $PM_{2.5}$ arise from a variety of sources, including road dust, diesel exhaust, fuel combustion, tire and brake wear, construction operations, and windblown dust. In the MCAB, most particulate matter is caused by woodstoves and fireplaces, residential open burning, dust emissions from construction and earth-moving equipment, forestry management burns, transport from agricultural burns, vehicle traffic and windblown dust (NSAQMD 2016). PM_{10} and $PM_{2.5}$ can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases such as asthma and chronic bronchitis. $PM_{2.5}$ is considered to have the potential to lodge deeper in the lungs. Diesel particulate matter (DPM) is classified a carcinogen by CARB.

Sulfur dioxide. SO_2 is a colorless, reactive gas that is produced from the burning of sulfur-containing fuels such as coal and oil, and by other industrial processes. Generally, the highest concentrations of SO_2 are found near large industrial sources. SO_2 is a respiratory irritant that can cause narrowing of the airways leading to wheezing and shortness of breath. Long-term exposure to SO_2 can cause respiratory illness and aggravate existing cardiovascular disease.

Lead. Lead in the atmosphere occurs as particulate matter. With the phase-out of leaded gasoline, large manufacturing facilities are the sources of the largest amounts of lead emissions. Lead has the potential to cause gastrointestinal, central nervous system, kidney and blood diseases upon prolonged exposure. Lead is also classified as a probable human carcinogen.

2.1.2 Toxic Air Contaminants

TACs are a category of air pollutants that have been shown to have an impact on human health but are not classified as criteria pollutants. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. Adverse health effects of toxic air contaminants can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Public exposure to TACs is a significant environmental health issue in California. TACs are different than the criteria pollutants previously discussed because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects, and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., of long duration) and acute (i.e., severe but of short duration) adverse effects on human

health. TACs discussed in this report include diesel particulate matter (DPM), naturally occurring asbestos, and crystalline silica.

Diesel Particulate Matter. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The solid emissions in diesel exhaust are known as diesel particulate matter (DPM). DPM is emitted from both mobile and stationary sources. Several major sources of DPM include ships, trains, and trucks in heavy industrial settings (CARB 2016b). Exposure to diesel exhaust can have immediate and long-term health effects. Diesel exhaust and many individual substances contained in it (including arsenic, benzene, formaldehyde, and nickel) have the potential to contribute to mutations in cells that can lead to cancer. In 1998, California identified DPM as a TAC based on its potential to cause cancer, premature death, and other health problems (e.g., asthma attacks and other respiratory symptoms). Those most vulnerable are children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's known cancer risk from outdoor air pollutants, with an estimated 70% of total known cancer risk attributable to DPM (CARB 2016b). Diesel engines also contribute to California's $PM_{2.5}$ air quality problems and cause visibility reduction (CARB 2011).

Naturally Occurring Asbestos. Chrysotile and amphibole asbestos (such as tremolite) occur naturally in certain geologic settings in California, most commonly in association with ultramafic rocks and along associated faults. Asbestos is a known carcinogen, and inhalation of asbestos may result in the development of lung cancer or mesothelioma. Exposing or disturbing rock and soil that contains naturally occurring asbestos can result in the release of fibers to the air and, consequently, public exposure. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos.

Crystalline Silica. Crystalline silica is a component of soil, sand, granite and many other minerals. Crystalline silica may become respirable-sized particles when workers chip, cut, drill or grind materials that contain it. If respirable crystalline silica dust enters the lungs, it causes the formation of scar tissue (silicosis) which can be disabling or even fatal, reducing the lungs' ability to take in oxygen and increasing the susceptibility to lung infections like tuberculosis. The non-crystalline form of silica (amorphous silica) is not nearly as toxic, since it usually does not cause the formation of scar tissue in the lungs. High occupational exposure to crystalline silica has been linked to respiratory problems and in some cases to cancer. Crystalline silica related illnesses historically have been associated with industrial processes such as mining. However, due to stringent health and safety regulations that have been imposed over the years, mining related respiratory illnesses have steadily declined.

2.2 GREENHOUSE GASES

2.2.1 Climate Change Overview

Global climate change refers to changes in average climatic conditions on Earth including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by atmospheric gases. These gases are commonly referred to as GHGs because they function like a greenhouse by letting sunlight in but preventing heat from escaping, thus warming the Earth's atmosphere.

GHGs are emitted by natural processes and human (anthropogenic) activities. Anthropogenic GHG emissions are primarily associated with: (1) the burning of fossil fuels during motorized transport,

electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition.

The temperature record shows a decades-long trend of warming, with 2016 global surface temperatures ranking as the warmest year on record (National Aeronautics and Space Administration [NASA] 2016). The newest release in long-term warming trends announced 2017 ranked as the second warmest year with an increase of 1.62 degrees Fahrenheit compared to the 1951-1980 average (NOAA 2018). GHG emissions from human activities are the most significant driver of observed climate change since the mid-20th century (Intergovernmental Panel on Climate Change [IPCC] 2013). The IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The statistical models show a "high confidence" that temperature increase caused by anthropogenic GHG emissions could be kept to less than two degrees Celsius relative to pre-industrial levels if atmospheric concentrations are stabilized at about 450 parts per million (ppm) carbon dioxide equivalent (CO_2e) by the year 2100 (IPCC 2014).

2.2.2 Types of Greenhouse Gases

The GHGs, as defined under California's Assembly Bill (AB) 32, include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Although water vapor is the most abundant and variable GHG in the atmosphere, it is not considered a pollutant; it maintains a climate necessary for life.

Carbon Dioxide. CO_2 is the most important and common anthropogenic GHG. CO_2 is an odorless, colorless GHG. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungi; evaporation from oceans; and volcanic outgassing. Anthropogenic sources of CO_2 include burning fuels, such as coal, oil, natural gas, and wood. Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. The atmospheric CO_2 concentration in 2010 was 390 ppm, 39 percent above the concentration at the start of the Industrial Revolution (about 280 ppm in 1750). As of December 2017, the CO_2 concentration exceeded 406 ppm, an approximately 2 ppm increase from December 2016 (National Oceanic and Atmospheric Administration [NOAA] 2018).

Methane. CH_4 is a gas and is the main component of natural gas used in homes. A natural source of methane is from the decay of organic matter. Geological deposits known as natural gas fields contain methane, which is extracted for fuel. Other sources are from decay of organic material in landfills, fermentation of manure, and cattle digestion.

Nitrous Oxide. N_2O is produced by both natural and human-related sources. N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production.

Hydrofluorocarbons. Fluorocarbons are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. Chlorofluorocarbons are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at Earth's surface). Chlorofluorocarbons were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped as

required by the Montreal Protocol. At present, there is a federal ban on chlorofluorocarbons (CFCs); therefore, it is assumed that the project would not generate emissions of this GHG. Implementation of the project may emit a small amount of HFC emissions from leakage, service of, and from disposal at the end of the life of refrigeration and air-conditioning equipment. However, details regarding refrigerants to be used in future construction are unknown at this time. Therefore, it is assumed that the project would not generate emissions of these pollutants and they are not further discussed in this analysis.

Sulfur hexafluoride. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semi-conductor manufacturing, and as a tracer gas for leak detection. No applications of this type would occur from the project. Therefore, it is not anticipated that the project would contribute significant emissions of SF_6 and it is not further discussed in this analysis.

GHGs have long atmospheric lifetimes that range from one year to several thousand years. Long atmospheric lifetimes allow for GHGs to disperse around the globe. Because GHGs vary widely in the power of their climatic effects, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, because methane and N_2O are approximately 25 and 298 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere, they have GWPs of 25 and 298, respectively (CO_2 has a GWP of 1). CO_2e is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 1, *Global Warming Potentials and Atmospheric Lifetimes*. As shown in the Table, the GWP for common GHGs ranges from 1 (CO_2) to 22,800 (SF_6).

Table 1
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide (CO_2)	50–200	1
Methane (CH_4)	12	25
Nitrous Oxide (N_2O)	114	298
HFC[1]-134a	14	1,430
PFC[2]: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: IPCC 2007
1 HFC: hydrofluorocarbons
2 PFC: perfluorocarbons

3.0 REGULATORY FRAMEWORK

3.1 AIR QUALITY REGULATIONS

Ambient air quality standards (AAQS) have been adopted at state and federal levels for criteria air pollutants. In addition, both the state and federal governments regulate the release of TACs. Nevada County is in the MCAB and is subject to the rules and regulations imposed by the Northern Sierra Air Quality Management District (NSAQMD), as well as the California AAQS adopted by the CARB and

National AAQS adopted by the USEPA. Federal, state, regional, and local laws, regulations, plans, and guidelines that are applicable to the project are summarized below.

3.1.1 Federal

Federal Clean Air Act

Air quality is defined by ambient air concentrations of specific pollutants identified by the USEPA to be of concern with respect to health and welfare of the general public. The USEPA is responsible for enforcing the Federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several criteria pollutants.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. CARB has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant. Table 2, *National and California Ambient Air Quality Standards*, shows the federal and state ambient air quality standards for these pollutants.

The USEPA has classified air basins (or portions thereof) as being in "attainment," "nonattainment," or "unclassified" for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. Table 3, *Nevada County Attainment Status*, lists the federal attainment status of Nevada County (located in the Mountain County Air Basin) for the criteria pollutants. The USEPA classifies Nevada County as in attainment or unclassified for CO, PM_{10}, $PM_{2.5}$, NO_2, SO_2, and lead; and in nonattainment for ozone (8-hour) with respect to federal air quality standards.

Table 2
NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[1]	Secondary[2]
O_3	1 Hour	0.09 ppm (180 µg/m^3)	–	–
	8 Hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Same as Primary
PM_{10}	24 Hour	50 µg/m^3	150 µg/m^3	Same as Primary
	AAM	20 µg/m^3	–	Same as Primary
$PM_{2.5}$	24 Hour	–	35 µg/m^3	Same as Primary
	AAM	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
CO	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–

Table 2
NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS (cont.)

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[1]	Secondary[2]
NO_2	1 Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	–
	AAM	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
SO_2	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	–	–
Lead	30-day Avg.	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m^3	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	**No Federal Standards**	
Sulfates	24 Hour	25 µg/m^3		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)		

Source: CARB 2016a

[1] National Primary Standards: The levels of air quality necessary, within an adequate margin of safety, to protect the public health.

[2] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

O_3: ozone; ppm: parts per million; µg/m^3: micrograms per cubic meter; PM_{10}: particulate matter with an aerodynamic diameter of 10 microns or less; AAM: Annual Arithmetic Mean; $PM_{2.5}$: fine particulate matter; CO: carbon monoxide; mg/m^3: milligrams per cubic meter; NO_2 nitrogen dioxide; SO_2: sulfur dioxide; km: kilometer; –: No Standard.

Table 3
NEVADA COUNTY ATTAINMENT STATUS

Criteria Pollutant	Federal Designation	State Designation
Ozone (1-hour)	(No Federal Standard)	Nonattainment
Ozone (8-hour)	Nonattainment (Western Nevada County)	Nonattainment
CO	Unclassified/Attainment	Unclassified
PM_{10}	Unclassified	Nonattainment
$PM_{2.5}$	Unclassified/Attainment	Unclassified
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
Lead	Unclassified/Attainment	Attainment

Source: CARB 2017b

3.1.2 State

California Clean Air Act

The federal CAA allows states to adopt AAQS and other regulations provided that they are at least as stringent as federal standards. The CARB, a part of the California EPA (CalEPA) is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the California Ambient Air Quality Standards (CAAQS). The CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. The CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. The CARB has primary responsibility for the development of California's SIP, for which it works closely with the federal government and the local air districts.

In addition to primary and secondary AAQS, the state has established a set of episode criteria for ozone, CO, NO_2, SO_2, and PM. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. Table 3, above, lists the state attainment status of the Nevada County portion of the MCAB for the criteria pollutants. Under State designation, Nevada County is in attainment for NO_2, SO_2, and lead; and in nonattainment for Ozone (1-hour and 8-hour); and unclassified for CO and $PM_{2.5}$.

State Implementation Plans

The CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The SIP is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA has the responsibility to review all SIPs to determine whether they conform to the requirements of the CAA.

Western Nevada County AQAP

As depicted in Table 3, Western Nevada County is in nonattainment for ozone with respect to both federal and state air quality standards and therefore must prepare an AQAP that demonstrates how ozone levels would be lowered to meet the standards as expeditiously as practical. The NSAQMD adopted all applicable "reasonably available control technologies" and must submit a "Rate of Progress" document to the CARB that demonstrates progress toward reaching attainment. Major air pollution sources are subject to an emission offset program, and federally funded projects such as highway improvements must be shown to not make the problem worse. As required by the CAA, Western Nevada County must reduce its emissions of ozone precursors by at least 3 percent per year. Most necessary reductions are expected from Statewide measures and from mobile sources becoming cleaner.

Air pollution sources associated with stationary sources are regulated through the permitting authority of the NSAQMD under the NSAQMD Rules and Regulations. Owners of any new or modified equipment that emits, reduces, or controls air contaminants, except those specifically exempted by the NSAQMD,

are required to apply for an Authority to Construct and Permit to Operate (NSAQMD Regulations IV and V). Additionally, best available control technology is required on specific types of stationary equipment. Through this mechanism, the NSAQMD ensures that all stationary sources within the project area would be subject to the standards of the SJVAPCD and that new developments do not result in net increases in stationary sources of criteria air pollutants. The AQAP prepared for the western Nevada County by the NSAQMD complies with this requirement. The CARB reviews, approves, or amends the document and forwards the plan to the USEPA for final review and approval within the SIP.

Toxic Air Contaminants

California's air toxics control program began in 1983 with the passage of the Toxic Air Contaminant Identification and Control Act, better known as AB 1807 or the Tanner Bill. When a compound becomes listed as a TAC under the Tanner process, the CARB normally establishes minimum statewide emission control measures to be adopted by local air pollution control districts (APCDs). Later legislative amendments (AB 2728) required the CARB to incorporate all 189 federal HAPs into the state list of TACs.

Supplementing the Tanner process, AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987, currently regulates over 600 air compounds, including all of the Tanner-designated TACs. Under AB 2588, specified facilities must quantify emissions of regulated air toxics and report them to the local APCD. If the APCD determines that a potentially significant public health risk is posed by a given facility, the facility is required to perform a health risk assessment and notify the public in the affected area if the calculated risks exceed specified criteria.

On August 27, 1998, CARB formally identified PM emitted in both gaseous and particulate forms by diesel-fueled engines as a TAC. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by the USEPA as HAPs and by CARB as TACs. CARB's Scientific Advisory Committee has recommended a unit risk factor (URF) of 300 in 1 million over a 70-year exposure period for diesel particulate. In September 2000, the CARB approved the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel Risk Reduction Plan; CARB 2000). The Diesel Risk Reduction Plan outlined a comprehensive and ambitious program that included the development of numerous new control measures over the next several years aimed at substantially reducing emissions from new and existing on-road vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). These requirements are now in force on a state-wide basis.

CARB Air Quality and Land Use Handbook

In 2005, CARB published the *Air Quality and Land Use Handbook* (the "CARB Handbook"), to serve as a general guide for considering health effects associated with siting sensitive receptors proximate to sources of TACs. The CARB Handbook explicitly states that it is advisory in nature and that local land use decisions do not have to be consistent with its recommendations. Some examples of CARB's recommendations include avoiding siting sensitive receptors within:

(a) 500 feet of a freeway, urban road with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day;

(b) 1,000 feet of a transport distribution centers;

(c) 300 feet of any dry cleaning operation using perchloroethylene; or

(d) within 500 feet for dry cleaning operation with two or more machines.

Naturally Occurring Asbestos

In 2002, CARB adopted a new Asbestos Airborne Toxic Control Measure for construction, grading, quarrying and surface mining operations. New emission control measures, such as dust suppressants, will apply to activities such as road construction and road maintenance, construction, grading, and quarrying and surface mining operations in areas with naturally-occurring asbestos, serpentine or ultramafic rock (CARB 2002). The air district may provide an exemption if a registered geologist has conducted a geologic evaluation of the property and determined that no serpentine or ultramafic rock is likely to be found in the area to be disturbed. Before an exemption can be granted, the owner/operator must provide a copy of a report detailing the geologic evaluation to the air district's Air Pollution Control Officer for consideration (CARB 2002).

Odorous Emissions Regulatory Framework

Because offensive odors rarely cause physical harm, no requirements for their control are included in state or federal air quality regulations. Any actions related to odors are based on citizen complaints to local governments and the NSAQMD. The occurrence and severity of odor impacts depend on the nature, frequency and intensity of the source; wind speed and direction; and the sensitivity of receptors. The *State CEQA Guidelines* recommend that odor impacts be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the source will mitigate odor impacts.

Proposition 65: Safe Drinking Water and Toxic Enforcement Act of 1986

Crystalline silica is subject to Proposition 65, which requires businesses emitting crystalline silica or other listed emissions at levels that exceed the significance risk threshold in Proposition 65, to notify the public of emissions and potential hazards. Crystalline silica has not been identified as a TAC under the California Toxic Air Contaminant Identification and Control Act, and there are no similar Federal laws or regulations that list crystalline silica as a hazardous air pollutant or TAC.

3.1.3 Local

Nevada County General Plan

The Nevada County General Plan serves as the overall guiding policy document for the unincorporated areas of Nevada County. The proposed project area is subject to the General Plan Land Use designation of Forest (FR) and is zoned Forest (FR) with a Mineral Extraction (ME) combining district (FR-160-ME). The conditions of the Nevada County Zoning Code allow surface mining operations within this zone when an ME combining overlay is in place, along with an approved Conditional Use Permit (CUP) and an approved Reclamation Plan.

According to the General Plan, the Forest (FR) designation with a Mineral Extraction (ME) Goal for the Nevada County area implements zoning regulations designed to balance the regional need for

construction materials with the community need for freedom from any disturbing effects of the surface mining activities while protecting public health (Nevada County 1995). The zoning regulation allows for surface mining to occur where adequate information indicates that significant mineral deposits are likely present.

Air quality impacts are controlled through policies and provisions of the Nevada County General Plan, and the Nevada County Municipal Code of Building Regulations. Each project should also demonstrate consistency with the NSAQMD's adopted Air Quality Attainment Plan (AQAP for ozone. The NSAQMD is required to submit a "Rate of Progress" document to the CARB that demonstrates past and planned progress toward reaching attainment for all criteria pollutants. The CCAA requires air pollution control district with air quality problems to provide for a 3 percent reduction in nonattainment emissions per year. The AQAP prepared for the western Nevada County by the NSAQMD complies with this requirement. The CARB reviews, approves, or amends the document and forwards the plan to the USEPA for final review and approval within the AQAP.

In addition, the County's General Plan contains policies, goals and objectives relating to air quality emissions which can be found in (but not limited to) the following chapters of Volume 1: Air Quality, Land Use, Circulation, Housing. Some of the applicable policies, goals and objectives from the *Air Quality Element* are listed below.

Goal 14.1; attain, maintain, and ensure high air quality

Objective 14.2; implement standards that minimize impacts on and/or restore air quality

Objective 14.3; identify regional impacts and coordinate with other agencies to achieve attainment

Policy 14.4; encourage and cooperate with the NSAQMD

Policy 14.5; the County shall work with the [Air] District to identify areas for monitoring and to develop an implementation program to begin on-site monitoring upon project applicant where a proposal will result in an increase of more than 25 tons per year of non-attainment pollutants (or precursors)

Policy 14.7A; the County shall, as part of its development review process, ensure that proposed discretionary developments address the requirements of NSAQMD Rule 226

NSAQMD Air Quality Guidelines

The NSAQMD is the local agency responsible for the administration and enforcement of air quality regulations for the Mountain Counties Air Basin (MCAB), which includes Nevada County. The NSAQMD is the agency primarily responsible for ensuring that federal and state ambient air quality standards are not exceeded and that air quality conditions are maintained. Responsibilities of NSAQMD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the federal CAA and the CCAA. In May 2016, the NSAQMD revised their *Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects* to provide guidance in evaluating air quality and GHG impacts from land use projects in the MCAB and in identifying

appropriate mitigations within the NSAQMD (NSAQMD 2016). NSAQMD rules and regulations applicable to the proposed project include, but are not necessarily limited to, the following:

Rule 205, Nuisance; this rule prohibits the discharge of air contaminants or other material from any source which cause injury, detriment, nuisance, or annoyance to any considerable number of persons, or to the public, or which endangers the comfort, repose, health, or safety of any such persons, or the public or which cause to have a natural tendency to cause injury or damage to business or property.

Rule 226, Dust Control; this rule requires the submittal of a Dust Control Plan to the NSAQMD for approval prior to any surface disturbance, including clearing of vegetation.

Rule 302, Prohibited Open Burning; in accordance with this rule, no person (except as otherwise authorized in Sections 41801–41805.6, 41807–41809, and 41811–41815 of the Health and Safety Code) shall use open outdoor fires for the purpose of disposal, processing, or burning of any flammable or combustible material as defined in Section 39020 of the Health and Safety Code; or unless issued a permit by NSAQMD and in accordance with other applicable NSAQMD rules and regulations, including, but not limited to*, Rule 308, Land Development Clearing*, and *Rule 312, Burning Permits*.

Rule 308, Land Development Clearing; the NSAQMD finds it more economically desirable to dispose of wood waste from trees, vines, and bushes on property being developed for commercial or residential purposes by burning instead of burial at a sanitary landfill. In such instances, disposal by burning shall comply with NSAQMD rules, including, but not limited to, Rule 312, Burning Permit Requirements; Rule 313, Burn Days; Rule 314, Minimum Drying Times; Rule 315, Burning Management; and Rule 316, Burn Plan Preparation.

Rule 501, Permit Required; Before any source may be operated, a Permit to Operate shall be obtained from the Air Pollution Control Officer. No Permit to Operate shall be granted either by the Air Pollution Control Officer or the Hearing Board for any source constructed or modified without authorization or not in compliance with other NSAQMD rules and regulations, including those specified in NSAQMD Regulation IV.

Rule 904, Asbestos Airborne Toxic Control Measure Asbestos-Containing-Serpentine; by reference, Title 17, section 93106, of the California Code of Regulations shall apply in its entirety.

The NSAQMD contains a Primary Screening Process which requires any project located near sensitive receptors such as a school, day care facility, hospital, or senior center, be reviewed for initial and recurring potential air emissions of criteria pollutants. Under the Primary Screening Process, both short term and long-term emission sources must be considered. In addition, any project with potential to emit odors which may impact a considerable number of persons, leading to a public nuisance, requires in-depth review. Lead agencies are encouraged to address potential land use conflicts or exposure of sensitive receptors to odors as early as possible in the development review process (NSAQMD 2016).

3.2 GREENHOUSE GAS EMISSIONS REGULATIONS

3.2.1 Federal

Federal Clean Air Act

The U.S. Supreme Court ruled in 2007, in Massachusetts v. U.S. Environmental Protection Agency (USEPA) that CO_2 is an air pollutant, as defined under the CAA, and that the USEPA has the authority to regulate emissions of GHGs. The USEPA announced that GHGs (including CO_2, CH_4, N_2O, HFC, PFC, and SF_6) threaten the public health and welfare of the American people. This action was a prerequisite to finalizing the USEPA's GHG emissions standards for light-duty vehicles, which were jointly proposed by the USEPA and the United States Department of Transportation's National Highway Traffic Safety Administration (NHTSA). The standards were established in 2010 for 2012 through 2016 model year vehicles and on in 2012 for 2017 through 2025 model year vehicles (USEPA 2017b; USEPA and NHTSA 2012).

3.2.2 State

There are numerous State plans, policies, regulations, and laws related to GHG emissions and global climate change. Following is a discussion of some of these plans, policies, and regulations that (1) establish overall State policies and GHG emission reduction targets; (2) require State or local actions that result in direct or indirect GHG emission reductions for the proposed project; and (3) require California Environmental Quality Act (CEQA) analysis of GHG emissions.

Executive Order S-3-05

In 2005, Executive Order (EO) S-3-05 proclaimed that California is vulnerable to climate change impacts. It declared that increased temperatures could reduce snowpack in the Sierra Nevada, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To avoid or reduce climate change impacts, EO S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Assembly Bill 32

The California Global Warming Solutions Act of 2006, widely known as AB 32, requires that the CARB develop and enforce regulations for the reporting and verification of statewide GHG emissions. CARB is directed to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

Executive Order S-01-07

This EO, signed by Governor Schwarzenegger on in 2007, directs that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by the year 2020. It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs CARB to determine whether a LCFS can be adopted as a discrete early action measure pursuant to AB 32. CARB approved the LCFS as a discrete early action item with a regulation adopted and implemented in April 2010. Although challenged in 2011, the Ninth Circuit reversed the District Court's

opinion and rejected arguments that implementing LCFS violates the interstate commerce clause in September 2013. CARB is therefore continuing to implement the LCFS statewide.

Senate Bill 375

Senate Bill (SB) 375 was signed and passed into law on September 30, 2008. SB 375 enhances CARB's ability to reach AB 32 goals. Specifically, SB 375 requires that CARB set regional targets for the purpose of reducing GHG emissions from passenger vehicles for the years 2020 and 2035. If regions develop integrated land use, housing, and transportation plans that meet the SB 375 targets, new projects in these regions can be relieved of certain review requirements of CEQA. The targets apply to the 17 regions in the state managed by metropolitan planning organizations (MPO). The CARB adopted its final targets on September 23, 2010.

Executive Order B-30-15

In 2015, EO B-30-15 established a California GHG emission reduction target of 40 percent below 1990 levels by 2030. The EO aligns California's GHG emission reduction targets with those of leading international governments, including the 28 nation European Union. California is on track to meet or exceed the target of reducing greenhouse gas emissions to 1990 levels by 2020, as established in AB 32. California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the goal established by EO S-3-05 of reducing emissions 80 percent under 1990 levels by 2050.

Senate Bill 32

As a follow-up to AB 32 and in response to EO-B-30-15, Senate Bill (SB) 32 was passed by the California legislature in 2016 to codify the EO's California GHG emission reduction target of 40 percent below 1990 levels by 2030.

California Air Resources Board Scoping Plan

In 2008, CARB adopted the Scoping Plan (CARB 2008) as directed by AB 32. The Scoping Plan proposes a set of actions designed to reduce overall GHG emissions in California to the levels required by AB 32. Measures applicable to development projects include those related to energy-efficiency building and appliance standards, the use of renewable sources for electricity generation, regional transportation targets, and green building strategy. Relative to transportation, the Scoping Plan includes nine measures or recommended actions related to reducing VMT and vehicle GHG emissions through fuel and efficiency measures. These measures would be implemented statewide rather than on a project by project basis.

CARB released the First Update to the Climate Change Scoping Plan in 2014 to provide information on the development of measure-specific regulations and to adjust projections in consideration of the economic recession (CARB 2014a). To determine the amount of GHG emission reductions needed to achieve the goal of AB 32 (i.e., 1990 levels by 2020) CARB developed a forecast of the AB 32 Baseline 2020 emissions, which is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. CARB estimated the AB 32 Baseline 2020 to be 509 million metric tons (MMT) of CO_2e. The Scoping Plan's current estimate of the necessary GHG emission reductions is 78 MMT CO_2e (CARB 2014a). This represents an approximately 15 percent reduction. CARB is forecasting that this would be achieved through the following reductions

by sector: 25 MMT CO_2e for energy, 23 MMT CO_2e for transportation, 5 MMT CO_2e for high-GWP GHGs, and 2 MMT CO_2e for waste. The remaining 23 MMT CO_2e would be achieved through Cap-and-Trade Program reductions. This reduction is flexible—if CARB receives new information and changes the other sectors' reductions to be less than expected, the agency can increase the Cap-and-Trade reduction (and vice versa).

In response to EO B-30-15 and SB 32, all state agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the Scoping Plan to reflect the 2030 target and, therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue driving down emissions. CARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The 2017 Climate Change Scoping Plan Update, Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target, was adopted in December 2017. The Scoping Plan Update establishes a proposed framework for California to meet a 40 percent reduction in GHGs by 2030 compared to 1990 levels. This is the most aggressive climate target in North America and aligns California with the rest of the world in flighting climate change. The Proposed Plan would continue to move California towards a sustainable future while shifting dependence away from fossil fuels. The Plan would build on the Cap-and-Trade Regulation, Low Carbon Fuel Standard program, and continue to increase the use of renewable energy through cleaner cars, trucks and freight movement, and reduce agricultural and waste methane emissions by utilizing it for energy needs. The Proposed Plan also addresses for the first time the GHG emissions from agriculture and forestry sectors along with other natural and working lands of California (CARB 2017c).

California Code of Regulations, Title 24, Part 6

California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in GHG emissions.

The Title 24 standards are updated approximately every three years to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest update to the Title 24 standards occurred in 2016 and went into effect on January 1, 2017. The 2016 update to the Building Energy Efficiency Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The most significant efficiency improvements to the residential Standards include improvements for attics, walls, water heating, and lighting. The Standards are divided into three basic sets. First, there is a basic set of mandatory requirements that apply to all buildings. Second, there is a set of performance standards – the energy budgets – that vary by climate zone (of which there are 16 in California) and building type; thus, the Standards are tailored to local conditions. Finally, the third set constitutes an alternative to the performance standards, which is a set of prescriptive packages that are basically a recipe or a checklist compliance approach.

California Green Building Standards Code

The California Green Building Standards Code (CALGreen; CCR Title 24, Part 11) is a code with mandatory requirements for new residential and nonresidential buildings (including industrial buildings) throughout California. The code is Part 11 of the California Building Standards Code in Title 24 of the CCR (California Building Standards Commission 2017). The current 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings went into effect on January 1, 2017.

The development of CALGreen is intended to (1) cause a reduction in GHG emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

CALGreen contains requirements for storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for the verification that all building systems, like heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

3.2.3 Local

Nevada County General Plan

The Nevada County General Plan was originally approved in 1996 and subsequently amended in 2008, 2010 and 2014, and most recently amended and adopted in October 2014. The existing General Plan contains 19 elements that cover all State-mandated topics as well as several additional topics, including Chapter 14, *Air Quality* and Chapter 17, *Mineral Management*.

The County's General Plan contains Chapter 14, *Air Quality Element* which sets goals, policies and objectives for attaining, maintaining and ensuring high air quality. Additional goals, policies and objectives relating to air quality and GHG emissions can be found in the following elements: *Land Use*, *Circulation*, and *Housing*. Goals, policies and objectives applicable to GHG emissions include, but are not necessarily limited to, the following:

Policy 14.2; encourage solar access, require all installations of solid fuel-burning devices and masonry/zero clearance fireplaces comply with current and applicable USEPA emissions standards.

Policy 14.4; cooperate with NSAQMD to encourage education and incentive programs to encourage energy conservation, solar energy use, house weatherization, and monitoring and advisory programs, develop biomass program and incentivize alternatives to outdoor burning, adopt control measures to reduce emissions from open burning, develop a program to regulate and control fugitive dust emissions from construction projects, identify and establish visibility standards for air quality in the county.

Policy 14.7; cooperate with appropriate agencies to develop programs to encourage employer-operated van pool and ride sharing for employees.

Goal RD-4.1, 4.2, 4.3, 4.4; reduce automobile dependency, need for new roadways and vehicle miles traveled while increasing alternative modes of transportation and transit ridership and vehicle occupancy.

Policy RD-4.3.4; minimize need to commute through balancing land use designations and local employment opportunities.

Policy EP-4.3, and *Goal EC-8.2* (Element 8, *Housing*); states it is the goal of the General Plan to encourage the reduction of GHG emissions, to the extent feasible, during the design phase of construction projects.

Policy EC-8.6.4; in addition to Title 24, Part 6 of the California Code of Regulations, the County shall promote energy efficiency and alternative energy sources for new and rehabilitated housing using incentives and site plan review recommendations.

NSAQMD Greenhouse Gas Guidelines

The NSAQMD has not established significance thresholds for greenhouse gas emissions from project operations. However, several rules and regulations are applicable to the management of GHG emissions (NSAQMD 2016).

4.0 EXISTING CONDITIONS

4.1 CLIMATE AND METEOROLOGY

The project site is located northeast of the Town of Truckee, in eastern Nevada County. The County lies within the central portion of Mountain Counties Air Basin (MCAB). This basin also includes Plumas, Sierra, Nevada, Calaveras, Tuolumne, and Mariposa counties, as well as a portion of Placer and El Dorado counties. The climate of MCAB is influenced by the foothill and mountainous terrain unique to the counties included in MCAB. Nevada County exhibits large variations in terrain and consequently exhibits large variations in climate, both of which affect air quality. Nevada County is bordered by the Sacramento Valley to the west, and the Washoe Valley to the east. Nevada County ranges from gently rolling slopes in the west to rugged Sierra Nevada mountain terrain in the east; elevations range from 200 to 9,000 feet. East of the divide, the slope of the Sierra Nevada is steeper to the Washoe valley floor.

The climate of Nevada County is characterized by hot, dry summers and cool, moist winters. The warmest areas in Nevada County are found at the lower elevations along the county's west side, while the coldest average temperatures are found at the highest elevations (Nevada County 1995). Air quality in the project area is influenced mostly by pollutant transport from upwind areas, such as the Sacramento Valley, but also by local emission sources, such as wood burning stoves and fireplaces during the winter months and vehicles using area roadways such as Interstate (I-) 80.

The prevailing wind direction over the county is westerly. However, the terrain of the area has a great influence on local winds, so that wide variability in wind direction can be expected. Afternoon winds are generally channeled up-canyon, while nighttime winds generally flow down-canyon. Winds are, in general, stronger in spring and summer and weaker in fall and winter. Periods of calm winds and clear skies in fall and winter often result in strong, ground based inversions forming in mountain valleys. These layers of very stable air restrict the dispersal of pollutants, trapping these pollutants near the

ground, representing the worst conditions for local air pollution occurring in the county (NSAQMD 2016).

Regional airflow patterns have an effect on air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions, such as light winds and shallow vertical mixing, and topographical features, such as surrounding mountain ranges, create areas of high pollutant concentrations by hindering dispersal. An inversion layer is produced when a layer of warm air traps cooler air close to the ground. Such temperature inversions hamper dispersion by stratifying contaminated air near the ground.

4.2 EXISTING AIR QUALITY

4.2.1 Attainment Designations

Attainment designations are discussed in Section 3.1, Table 3. Nevada County is in nonattainment for ozone with respect to both federal and state air quality standards.

4.2.2 Monitoring Data

The primary criteria air pollutants of concern in the project area include O_3 and particulate matters (PM_{10}/$PM_{2.5}$). Ambient concentrations of CO are typically low, though localized concentrations, particularly near congested roadway intersections, are a potential local concern during cold weather.

The NSAQMD operates several ambient air monitoring stations throughout the Mountain Counties Air Basin. The purpose of the monitoring stations is to measure ambient concentrations of air pollutants and determine whether the ambient air quality meets the NAAQS and the CAAQS. In Nevada County, ambient air quality is currently monitored at stations located in the City of Grass Valley, in the Town of Truckee, and at one seasonal location in Nevada County known as White Cloud Mountain. The closest monitoring site to the proposed project is the Truckee Fire Station Monitoring Station, which monitors ambient concentrations of $PM_{2.5}$. Data was obtained from the White Cloud Mountain Monitoring Station for O_3. Table 4, *Air Quality Monitoring Data,* presents a summary of published ambient air quality data obtained from these two stations during the last three available years (2014 through 2016).

As shown in Table 4, the 1-hour O_3 concentration did not exceed State standards in 2015 or 2015 and had insufficient data in 2016. The 8-hour O_3 concentration exceeded the state standard eighteen times in 2014, six times in 2015 and had insufficient data in 2016. The 8-hour O_3 concentration exceeded the federal standard five times in 2014, twice in 2015 and had insufficient data in 2016. The federal $PM_{2.5}$ standard had insufficient data for 2014 and 2015, and did not exceed the standard in 2016.

Table 4
AIR QUALITY MONITORING DATA

Pollutant	2014	2015	2016
Ozone (O_3) White Cloud Mountain Monitoring Station			
Maximum 1-hour concentration (ppm)	0.093	0.082	*
Days above 1-hour state standard (>0.09 ppm)	0	0	*
Maximum 8-hour concentration (ppm)	0.080	0.078	*
Days above 8-hour state standard (>0.07 ppm)	18	6	*
Days above 8-hour federal standard (>0.075 ppm)	5	2	*
Fine Particulate Matter ($PM_{2.5}$) Truckee Fire Station Monitoring Station			
Maximum 24-hour concentration ($\mu g/m^3$)	13.2	12.8	22.1
Days above federal standard (>35 $\mu g/m^3$)	*	*	0

Source: CARB 2017a
Notes: Underlined values in excess of applicable standard; ppm = parts per million;
µg/m3 = micrograms per cubic meter
*Insufficient data to determine the value

4.3 EXISTING GREENHOUSE GAS LEVELS

For 2012, total GHG emissions worldwide were estimated at 46,049 MMT CO_2e (World Resources Institute 2017). The U.S. contributed the second largest portion of GHG emissions (behind China) at 12 percent of global emissions, with 5,823 MMT CO_2e in 2012. On a national level in 2013, approximately 27 percent of GHG emissions are associated with transportation and about 31 percent are associated with electricity generation (USEPA 2015). In 2015, California produced a total of 440 MT CO_2e (CARB 2017d). The transportation sector is the single largest category of California's GHG emissions, accounting for 39 percent of emissions statewide in 2015 (CARB 2017d). This category was followed by the and the industrial sector with 23 percent and the electricity generation sector with 19 percent (CARB 2017d).

CARB performs statewide GHG inventories. The inventory is divided into six broad sectors; agriculture and forestry, commercial, electricity generation, industrial, residential, and transportation. Emissions are quantified in MMT CO_2e. Table 5, *California Greenhouse Gas Emissions by Sector*, shows the estimated statewide GHG emissions for the years 1990, 2000, 2010, and 2015.

Table 5
CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR
(MMT CO_2e)

Sector	1990	2000	2010	2015
Agriculture and Forestry	23.6 (5%)	32.1 (7%)	34.5 (8%)	34.6 (8%)
Commercial	14.4 (3%)	15.0 (3%)	21.6 (5%)	22.2 (5%)
Electricity Generation	110.6 (26%)	105.2 (22%)	90.5 (20%)	84.1 (19%)
Industrial	103.0 (24%)	105.4 (22%)	102.7 (23%)	103.0 (23%)
Residential	29.7 (7%)	31.8 (7%)	32.2 (7%)	26.9 (6%)
Transportation	150.7 (35%)	178.1 (38%)	173.7 (38%)	169.4 (39%)
Unspecified Remaining	1.3 (<1%)	1.2 (<1%)	0.8 (<1%)	0.82(<1%)
TOTAL	**433.3**	**468.8**	**456.0**	**440.4**

Source: CARB 2007, CARB 2015, and CARB 2017d

As shown in Table 5, statewide GHG emissions totaled 433 MMT CO_2e in 1990, 469 MMT CO_2e in 2000, 456 MMT CO_2e in 2010, and 440 MMT CO_2e in 2015. Transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions.

4.4 BASELINE CONDITIONS

The expansion of Boca Quarry is necessitated by the demand for aggregate in Nevada County such as, from road construction, repaving of I-80 and general public and private road construction and maintenance. This demand will not change if this project is approved or denied. As a result, denial of the project would not lead to zero emissions or lower emissions because aggregate production would be shifted to other, more distant, sources. Thus, regardless of the sources of aggregate, air pollutants and GHG emissions would be released in the process of meeting the local demand for aggregate.

5.0 METHODOLOGY AND THRESHOLDS

5.1 METHODOLOGY

5.1.1 Off-Site Roadway Improvement Emissions

Emissions for the off-site roadway improvement construction were modeled using the SMAQMD Road Construction Emissions Model, Version 8.1.0. This model utilizes 2014 EMFAC factors and OFFROAD factors to calculate vehicle exhaust and fugitive dust emissions. Fugitive dust emissions are calculated estimating the maximum area (acres) of land disturbed daily. Off-site roadway improvement construction would disturb a total of 22 acres over 1 month (22 working days) of construction and therefore would disturb approximately six acres of land per day. A detailed list of equipment associated with each phase of the roadway improvement project is provided in Appendix A.

Construction of the proposed sight distance and bicycle safety mitigation measures was assumed to occur as early as 2020. Details and assumptions regarding construction phases, hours of operation, truck hauling and construction worker estimates are summarized in Section 16 and detailed in Appendix A. During grading and earthwork, as a worst-case assumption, excess material would be sent via I-80 and SR 267 to Teichert's Martis Valley facility. (Excess material could also be brought to Teichert's Truckee Quarry and Boca Quarry locations but are closer than Martis Valley.)

Emission estimates assume the use of water trucks, yielding a 50% control of fugitive dust from watering and associated dust control measures.

A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

5.1.2 Mining Operation Emissions

The analysis utilizes emission factors from CARB's OFFROAD and EMFAC models for off-road equipment and on-road vehicles, respectively. In addition, emission factors for aggregate processing, blasting and mining, and additional sources of fugitive dust were determined based on methodology found in the USEPA's *Compilation of Air Pollutant Emission Factors* (AP-42) (USEPA, 2011), the South Coast Air Quality Management District's handbook (SCAQMD 1993), and the Sacramento Metropolitan Air Quality

Management District's (SMAQMD) *Aggregate & Rock Crushing Operations Policy Manual* (SMAQMD 2008).

The three production scenarios, associated hours of operation and equipment are listed in Tables 7-9 below. In addition, equipment used during site preparation, which does not differ by scenario, is found in Table 6, *Site Preparation Vehicular & Heavy Equipment*.

The emission calculations assumed that mining equipment and the processing plant will be operating on-site depending on the market demand and hours of operations for the aggregate products. Hours of operation for each scenario are listed in the following sections. For modeling purposes, the following construction and operation timeline was assumed for a conservative analysis. It was assumed that mining of the East Pit could commence as early as 2019 (as mining could occur under the existing entitlements), and mining of the West Pit could commence as early as 2020 (following road improvement construction which could begin as early as 2020). For the employee vehicles and heavy haul truck operations, the estimated daily vehicle miles traveled (VMT) were obtained from the Teichert Boca Quarry Expansion Traffic Impact Analysis (TIA) (LSC Transportation Consultants, Inc. 2017). The average one-way truck trip length would be 20 miles for aggregate hauling. Employee vehicle trips would generate approximately 315 VMT per day for 15 employees. Emission rates for employee vehicles and heavy truck operations were developed from the CARB 2014 EMFAC model, which calculates emission rates for vehicles based on vehicle classes (for example, light-duty autos, medium-heavy trucks, heavy duty trucks). The trips per day and daily VMT are summarized in each scenario below.

Site Preparation

Preparation of the West Pit for mining activities will include removal of all organic material and salvage of the existing top soil. All trees within the footprint of the area to be mined would be removed using both heavy equipment and hand tools. Site Preparation, for a conservative analysis, assumes vehicles would operate for a maximum 16 hours per day for a maximum duration of 93 days. Site preparation may occur all at once prior to the initiation of mining in the West Pit or in phases which would be determined based on the mining pit phasing and areas being accessed based on market demand. Site Preparation would include the harvesting of approximately 750 commercially viable trees, yielding a total of 188 one-way trips to transport the harvested trees and 14,100 VMT. Trees would be transported via heavy duty diesel trucks to a lumber mill located in Quincy. Up to 20 one-way trips per day could occur during the timber harvest. If site preparation occurs in phases concurrent with mining activity, these trips would replace aggregate exporting truck trips and would not affect the overall worst-case daily vehicle trips.

Table 6
SITE PREPARATION VEHICULAR & HEAVY EQUIPMENT

Equipment	No. of Equipment per Day	Hours per Vehicle per Day	Vehicle Hours per Day
Dozer	1	16	16
Loader	1	16	16
Portable Pump	1	16	16
Excavator	1	16	16
Water Truck	1	16	16

Scenario 1: Peak Daily Production

Peak Daily Production analyzes peak production based on a typical workday (12 hours per day for approximately 180 working days) production of 4,100 tons per day, yielding approximately 738,000 tons per year. Scenario 1 would generate 571 one-way trips per day and 11,410 VMT. If timber operations occur concurrently with operation, the timber harvest truck trips would replace haul truck trips, and the VMT would increase by 1,100 VMT to 12,510. This worse-case scenario was analyzed.

Table 7
SCENARIO 1: PEAK DAILY VEHICULAR & HEAVY EQUIPMENT

Equipment	No. of Equipment per Day	Hours per Vehicle per Day	Vehicle Hours per Day
Quarry Mine Operation			
Dozer	1	12	12
Loader	1	12	12
Portable Pump	1	12	12
Excavator	1	12	12
Water Truck	1	12	12
Aggregate Processing Plant			
Loader	1	12	12
Haul Trucks	4	12	48
Jaw Crusher	1	12	12
Screening System	1	12	12

Scenario 2: Worst-Case Daily Production

Worst-Case Daily Production analyzes the worst-case daily production of 10,080 tons per day based on the maximum number of trucks able to be managed on-site. This scenario assumes equipment is operating continuously for 16 hours with load-out occurring up to 24-hours per day, six days a week, yielding a maximum 10,080 tons per day. An estimated annual production of 1,000,000 tons would equate to approximately 93 working days. Scenario 2 would generate 1,402 one-way trips per day and 28,021 VMT. If timber operations occur concurrently with operation, the timber harvest truck trips would replace haul truck trips, and the VMT would increase by 1,100 VMT to 29,121. This worse-case scenario was analyzed.

Table 8
SCENARIO 2: WORST-CASE DAILY VEHICULAR & HEAVY EQUIPMENT

Equipment	No. of Equipment per Day	Hours per Vehicle per Day	Vehicle Hours per Day
Quarry Mine Operation			
Dozer	1	16	16
Loader	1	16	16
Portable Pump	1	16	16
Excavator	1	16	16
Water Truck	1	16	16

Table 8
SCENARIO 2: WORST-CASE DAILY VEHICULAR & HEAVY EQUIPMENT (cont.)

Equipment	No. of Equipment per Day	Hours per Vehicle per Day	Vehicle Hours per Day
Aggregate Processing Plant			
Loader	1	16	16
Haul Trucks	4	16	64
Jaw Crusher	1	16	16
Screening System	1	16	16
Loader	1	16	16

Scenario 3: Average Daily Production

Average Daily Production, assumes an average production of approximately 3,170 tons per day yielding 570,000 tons per year based on a normal 8 hours per day work shift for approximately 180 working days Calculations for *Average Annual Production* are based on *Average Daily Production* multiplied by 180 working days per year and therefore utilize the equipment listed below in Table 9. Scenario 3 would generate 442 one-way trips per day and 8,827 VMT. If timber operations occur concurrently with operation, the timber harvest truck trips would replace haul truck trips and the VMT could increase by 1,100 VMT to 9,927. This worse-case scenario was analyzed.

Table 9
SCENARIO 3: AVERAGE DAILY VEHICULAR & HEAVY EQUIPMENT

Equipment	No. of Equipment per Day	Hours per Vehicle per Day	Vehicle Hours per Day
Quarry Mine Operation			
Dozer	1	8	8
Loader	1	8	8
Portable Pump	1	8	8
Excavator	1	8	8
Water Truck	1	8	8
Aggregate Processing Plant			
Loader	1	8	8
Haul Trucks	4	8	32
Jaw Crusher	1	8	8
Screening System	1	8	8

5.1.3 TAC Impacts to Sensitive Receptors

Project impacts may include emissions of pollutants identified by the state as TACs. Sensitive receptors are typically defined as schools (preschool through 12th grade), hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality.

According to the NSAQMD, impacts of hazardous air pollutants, such as asbestos and diesel exhaust, should be evaluated. In addition, projects must be modeled and analyzed if located within 1,000 feet of sensitive receptors. Since the proposed quarry is not within 1,000 feet of sensitive receptors, no Health Risk Assessment was conducted.

5.1.4 Odors

The NSAQMD requires odors to be identified and assessed as early as possible in the development review process. This includes odors associated with land use conflicts or exposing sensitive receptors to a new odor source. During the NSAQMD's Primary Screening Process, any project with the potential to emit an odor impacting a considerable number of persons must be reviewed in depth (NSAQMD 2016). Potential odor impacts are evaluated by conducting a qualitative screening-level analysis by reviewing the proposed project's site plan and description to identify any new or modified odor sources or the exposure of a new receptor to existing or planned odor sources.

5.2 SIGNIFICANCE CRITERIA

5.2.1 Air Quality

According to Appendix G of the State CEQA Guidelines, a project would have a significant air quality environmental impact if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan;

2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

4. Expose sensitive receptors (i.e., day care centers, schools, retirement homes, and hospitals or medical patients in residential homes which could be impacted by air pollutants) to substantial pollutant concentrations; or

5. Create objectionable odors affecting a substantial number of people.

NSAQMD thresholds have been used to determine air quality impacts in this analysis. To assist local jurisdictions in the evaluation of air quality impacts, the NSAQMD has published a guidance document for the preparation of the air quality portions of environmental documents that includes thresholds of significance to be used in evaluating land use proposals. Thresholds of significance are based on a source's projected impacts and are a basis from which to apply mitigation measures (NSAQMD 2016). The NSAQMD has developed a tiered approach to significance levels:

- A project with emissions meeting Level A thresholds will require the most basic mitigations;

- Projects with projected emissions in the Level B range will require more extensive mitigations; and

- Those projects which exceed Level C thresholds will require the most extensive mitigations.

The NSAQMD-recommended thresholds are identified in Table 10.

Table 10
NSAQMD AIR POLLUTANT THRESHOLDS

Significance Level	Project-Generated Emissions (pounds/day)		
	NO_X	ROG	PM_{10}
Level A	<24	<24	<79
Level B	24-136	24-136	79-136
Level C	>136	>136	>136

Source: NSAQMD 2016.

According to the NSAQMD (NSAQMD 2016), these thresholds are recommended for use by lead agencies when preparing initial studies. If, during the preparation of the initial study, the lead agency finds that any of the following thresholds may be exceeded and cannot be mitigated down to Level B, then a determination of significant air quality impact must be made and an Environmental Impact Report is required.

For evaluation of project-related air quality impacts, implementation of the proposed project would be considered significant if the project would:

- Exceed NSAQMD-recommended significance thresholds, as identified in Table 10. In accordance with NSAQMD-recommended thresholds of significance, project-generated short- or long-term increases in emissions in excess of Level C thresholds for NO_X, reactive organic gases (ROG), or PM_{10} would be considered significant. The NSAQMD has not adopted thresholds of significance for $PM_{2.5}$. However, because $PM_{2.5}$ is a subset of PM_{10}, significant increases in PM_{10} would be considered to also result in significant increases in $PM_{2.5}$.

  It is important to note that in cases when predicted emissions are projected to be below the Level C thresholds but exceeding the Level A thresholds (thereby placing project-related air quality impacts at Level B), the project would be considered potentially significant, subject to the recommended measures of NSAQMD's *Mitigation for Use During Design and Construction Phases for Classifications as Level B Threshold* (NSAQMD 2016). Implementation of the appropriate NSAQMD mitigation from this collection of measures would reduce Level B air quality impacts to a less than significant level.

- Exceed the NSAQMD health risk public notification thresholds set at 10 excess cancer cases in a million for cancer risk, or a Hazard Index of greater than one (1.0) for noncancer risk.

- Contribute to localized concentrations of air pollutants at nearby receptors that would exceed applicable ambient air quality standards.

- Result in the frequent exposure of sensitive land uses to odorous emissions.

In addition, *Policy 14.5* of the Nevada County General Plan *Air Quality Element* states that "the County shall work with the [Air] District to identify areas for monitoring and to develop an implementation program to begin on-site monitoring upon project applicant where a proposal will result in an increase of more than 25 tons per year of non-attainment pollutants (or precursors)."

Open burning of vegetation for land development clearing is subject to the permitting process of the NSAQMD Rule 308. Burn quantities and days when burning is allowed is determined in the permit

process to ensure that NAAQS and CAAQS for the air basin are not exceeded. The NSAQMD air pollutant thresholds do not apply to permitted open burning of vegetation. This report provides an estimate of open vegetation burning emissions for informational purposes.

5.2.2 Greenhouse Gases

Given the relatively small levels of emissions generated by a project in relationship to the total amount of GHG emissions generated on a national or global basis, individual projects are not expected to result in significant, direct impacts with respect to climate change. However, given the magnitude of the impact of GHG emissions on the global climate, GHG emissions from new development could result in significant, cumulative impacts with respect to climate change. Thus, the potential for a significant GHG impact is limited to cumulative impacts.

According to Appendix G of the State CEQA Guidelines, the following criteria may be considered in establishing the significance of GHG emissions:

Would the project:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

As discussed in Section 15064.4 of the State CEQA Guidelines, the determination of the significance of GHG emissions calls for a careful judgment by the lead agency, consistent with the provisions in Section 15064. Section 15064.4 further provides that a lead agency should make a good faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project.

As stated earlier, NSAQMD 2016 *Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects* requires GHG emissions to be quantified for decision-makers and the public to consider, however does not have thresholds for GHG emissions (NSAQMD 2016). This report provides an assessment of GHG emissions and impacts for informational purposes.

5.2.3 TAC Impacts to Sensitive Receptors

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as TACs or Hazardous Air Pollutants (HAPs).

With regard to evaluating whether a project would have a significant impact on sensitive receptors, air quality regulators typically define sensitive receptors as schools (preschool through 12th grade), hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial, commercial, retail, and office areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, because the majority of the workers tend to stay indoors most of the time. In addition, the

working population is generally the healthiest segment of the public. Any project that has the potential to directly impact a sensitive receptor located within one-quarter mile and results in a health risk greater than 10 in 1 million would have a potentially significant impact.

The NSAQMD encourages lead agencies to identify and address air quality issues as early as possible during the development process, which includes exposure of sensitive receptors to toxics and criteria pollutants. Further, NSAQMD has a Primary Screening Process which requires any project located near sensitive receptors such as a school, day care facility, hospital, or senior center, be reviewed for initial and recurring potential air emissions of criteria pollutants. Under the Primary Screening Process, both short term and long term emission sources must be considered.

5.2.4 Odors

The NSAQMD has an established screening process which requires in-depth review of any project with potential to emit odors which may impact considerable number of persons, leading to a public nuisance. Additionally, NSAQMD encourages lead agencies to address potential land use conflicts (such as odors), or exposure of sensitive receptors to odors as early as possible in the development review process (NSAQMD 2016). Common land uses that have the potential to generate substantial odor complaints, include wastewater treatment plants, landfills or transfer stations, composting facilities, confined animal facilities, food manufacturing, and chemical plants.

6.0 AIR QUALITY IMPACT ANALYSIS

This section evaluates potential direct impacts of the proposed project related to the air pollutant emissions. project-level air quality modeling was completed as part of this analysis. Complete modeling results are included as Appendix A of this report.

6.1 CONSISTENCY WITH AIR QUALITY PLANS

6.1.1 Required Evaluation Guidelines

State CEQA Guidelines and the CAA (Sections 176 and 316) contain specific references on the need to evaluate consistencies between the proposed project and the applicable SIP for the project site. To accomplish this, the CARB has developed a three-step approach to determine project conformity with the applicable SIP.

1. *Determination that an AQAP is being implemented in the area where the project is being proposed*.

   The NSAQMD has implemented the current AQAP as approved by the CARB.

2. *The proposed project must be consistent with the growth assumptions of the applicable AQAP*.

   The proposed project is included within the population and residential property increases projected in the Nevada County General Plan. The growth represented by the proposed project was anticipated by the General Plan, therefore the expansion of the quarry, which is zoned as Forest (FR) with a Mineral Extraction (ME) combining district (FR-160-ME), is consistent with the plan. Proposed project truck travel is a small percentage of total county vehicle travel. Additionally, the growth

assumptions in the AQAP include emissions associated with activities necessary to meet the growth demand for aggregate, concrete, and other building materials; and the proposed project emissions can easily be accommodated within those growth assumptions.

3. *The project must contain in its design all reasonably available and feasible air quality control measures*.

The proposed project would be required to implement all applicable basic requirements for compliance with district/state rules and regulations, including, but not limited to: Rule 226 Dust Control; Rule 205 Nuisance; Rule 302 Prohibited Opening Burning; Rule 308 Land Development Clearing; Rule 501 Permit Required; and Rule 904 *Asbestos Airborne Toxic Control Measure Asbestos-Containing-Serpentine.* Additionally, the AQAP includes emission budgets from stationary and mobile emission sources and fugitive dust. The CCAA and AQAP identify transportation control measures to further reduce emissions from mobile sources. Strategies identified to reduce vehicular emissions, such as reductions in vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, and traffic congestion in order to reduce vehicular emissions, would be implemented as control measures under the CCAA. Therefore, the proposed project would be in compliance with all of the applicable NSAQMD permitting and operation requirements.

As demonstrated above, the project would be consistent with Steps 1 through 3 and would therefore be in compliance with the AQAP and would not conflict with or obstruct implementation of the air quality plan.

6.1.2 Nevada County General Plan

The Nevada County General Plan serves as the overall guiding policy document for the unincorporated areas of Nevada County. The Nevada County General Plan Air Quality Element contains Policy 14.5 which states that "the County shall work with the [Air] District to identify areas for monitoring and to develop an implementation program to begin on-site monitoring where a proposal will result in an increase of more than 25 tons per year of non-attainment pollutants (or precursors)." The average annual operations would occur during a typical 8-hour work day for 180 days per year. Table 11 presents the average annual criteria pollutant emissions based on Scenario 3, Average Daily ("average day" multiplied by 180 days per year). Annual average operational emissions do not include one-time roadway improvement construction or site preparation. Emissions would remain below the General Plan criterion of 25 tons per year for each criteria pollutant and therefore the air quality impacts associated with the annual operational emissions would be considered less than significant.

Table 11
ANNUAL AVERAGE QUARRY OPERATIONAL EMISSIONS

	Criteria Pollutant Emissions (tons/year)					
	ROG	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Mining Activities	0.26	1.55	2.65	0.00	2.51	2.00
Materials Processing	0.39	2.27	3.61	0.01	11.70	6.26
On- and Off-site Traffic	0.25	1.23	7.78	0.03	0.23	0.11
TOTAL	**0.89**	**5.05**	**14.04**	**0.04**	**14.44**	**8.37**
Nevada County GP Significance Threshold	25	n/a	25	n/a	25	n/a
Significant Impact?	*No*	*n/a*	*No*	*n/a*	*No*	*n/a*

Source: Appendix A
Notes: Average annual production is assumed to be 570,000 tons per year. All annual average calculations are based off of an average day multiplied by 180 (days per year).

6.2 CONFORMANCE TO FEDERAL AND STATE AIR QUALITY STANDARDS

The project would generate criteria pollutants during quarry operation-related activities, including aggregate processing, on-site equipment, explosive detonation, and truck traffic. In addition, the project would generate temporary emissions due to off-site roadway improvement construction during vegetation removal, site clearing, grading and paving activities. Operational emissions were conducted for three operating scenarios, as described in Section 5.1.1, to determine the proposed project's emissions.

6.2.1 Construction Air Quality Emissions

Off-Site Roadway Improvement Air Quality Emissions

Off-site roadway improvement emissions were estimated using the SMAQMD Road Construction Emissions Model, Version 8.1.0 which utilizes EMFAC factors and OFFROAD factors to calculate vehicle exhaust and fugitive dust emissions. Project-specific input was based on general information provided in Section 1.0, input from the client, and default model settings to estimate reasonably conservative conditions. Specific equipment specifications were provided by the project applicant, Teichert Aggregate Inc., and are summarized in Section 5.1.2, *Roadway Improvement Emissions*. Assumptions and details are included in Appendix A.

The project would emit temporary criteria air pollutants during approximately one month of off-site roadway improvement construction. The emissions generated from a maximum 22 acres of disturbed land due to site preparation and constructional activities include:

- Dust (including PM_{10} and $PM_{2.5}$) primarily from fugitive sources such as soil disturbance, and vehicle travel over unpaved surfaces;

- Combustion emissions of air pollutants (including ROG, NO_X, PM_{10}, $PM_{2.5}$, CO, and SO_X) primarily from operation of heavy off-road equipment

Table 12 summarizes the emissions generated by the off-site roadway improvement.

Table 12
ESTIMATED OFF-SITE ROADWAY IMPROVEMENT AIR QUALITY EMISSIONS

Construction Phases	Criteria Pollutant Emissions (lbs/day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Grubbing and Land Clearing	2.24	20.42	24.64	0.06	56.21	12.42
Grading and Excavation	10.65	88.60	114.74	0.19	60.72	16.44
Drainage, Utilities and Sub-Grade	7.43	69.79	71.76	0.15	59.08	15.01
Paving	2.86	34.51	27.82	0.08	1.88	1.52
MAXIMUM	10.65	88.60	114.74	0.19	60.72	16.44
Thresholds (lbs/day)	137	none	137	none	137	none
Significant Impact?	*No*	*n/a*	*No*	*n/a*	*No*	*n/a*

Source: Appendix A
Notes: There are no criteria pollutant emission standards for CO, ROG, and $PM_{2.5}$, however $PM_{2.5}$ is a surrogate for PM_{10}, the daily threshold of 137 pounds per day was used for $PM_{2.5}$ as well

For roadway improvement construction, criteria pollutant emissions would not exceed the NSAQMD threshold and therefore would be considered a less than significant impact.

Site Preparation

Site preparation would occur prior to quarry operations over a 93-day period and would involve: removal of vegetation and overburden; grading; and removal of topsoil. For a conservative analysis, site preparation assumes vehicles would operate for a maximum 16 hours per day. As depicted in Table 13, criteria pollutant emissions associated with site preparation activities would be below the NSAQMD thresholds and would therefore be less than significant.

Table 13
ESTIMATED SITE PREPARATION AIR QUALITY EMISSIONS

Site Preparation	Criteria Pollutant Emissions Levels (lbs/day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Blasting	0.55	4.16	7.04	0.02	14.20	14.19
Off-road Vehicle Combustion	5.16	30.26	51.77	0.07	2.38	2.22
On-road Vehicle Combustion	0.04	0.20	1.30	0.01	0.04	0.02
Fugitive Dust	-	-	-	-	26.88	11.78
TOTAL	**5.76**	**34.61**	**60.12**	**0.10**	**43.50**	**28.21**
NSAQMD Significance Threshold	137	n/a	137	n/a	137	n/a
Significant Impact?	*No*	*n/a*	*No*	*n/a*	*No*	*n/a*

Notes: There are no criteria pollutant emission standards for CO, ROG, and $PM_{2.5}$, however $PM_{2.5}$ is a surrogate for PM_{10}, the daily threshold of 137 pounds per day was used for $PM_{2.5}$ as well.
Modeling outputs provided in Appendix A

Vegetation Burning

Emissions from burning piles of vegetation stripped from project site were estimated using the United States Forest Service (USFS) Fuel and Fire Tools version 2.0, Fuel Characteristic Classification System Module (2015), and the USFS Piled Fuels Biomass and Emissions Calculator web application (2014). The species, area coverage and density of the predominant vegetation to be stripped were obtained from

the BOCA Quarry Use Permit and Reclamation Plan Modification report (Teichert Aggregates 2011). The Fuel and Fire Tools only provide criteria pollutant emissions estimates for CO, PM_{10}, and $PM_{2.5}$. Table 14 presents the estimated vegetation burning emissions for the project. The NSAQMD air pollutant thresholds do not apply to permitted open burning of vegetation—this estimate of open vegetation burning emissions is provided for informational purposes.

Table 14
ESTIMATED VEGETATION BURNING EMISSIONS

	Acres	Loading (tons/acre)	Biomass (tons)	Criteria Pollutant Emissions (tons)		
				CO	PM_{10}	$PM_{2.5}$
Total Project	118	94.5	11,155.7	381.5	100.4	85.3
Maximum Annual	6.9	94.5	656.2	22.4	5.9	5.0

[1] Maximum annual emissions based on the worst-case year of 1 million tons out of the total 17 million tons of aggregate mined (5.9 percent).

Modeling outputs provided in Appendix A

Burning of vegetation cleared from the project site could result in exceedance of the NAAQS and/or CAAQS for nonattainment criteria air pollutants in the air basin. This would be a potentially significant impact. Open burning of vegetation for land development clearing is subject to the permitting process of the NSAQMD Rules 308, 312, 313, 314, 315 and 316. Burn quantities and days when burning is allowed is determined in the permit process to ensure that NAAQS and CAAQS for the air basin are not exceeded. Mitigation Measure AQ-01 would require adherence to the NSAQMD burn permit rules:

Mitigation Measure AQ-01: Prior to any open burning of vegetation, the Project Applicant shall obtain a burn permit in accordance with the NSAQMD Regulation III, Open Burning. All applicable requirements established for obtainment of a burn permit, notification of the air district or other entities, and execution of burning authorized by the permit shall be followed in accordance with NSAQMD Rules:

- Rule 308 – Land Development Clearing
- Rule 312 – Burning Permits
- Rule 313 – Burn Day
- Rule 314 – Minimum Drying Times
- Rule 315 – Burning Management Requirements
- Rule 316 – Burn Plan Preparation

Significance after Mitigation: Less than significant.

6.2.2 Operational Air Quality Emissions

Project emissions were estimated using the EMFAC and OFFROAD models and USEPA, SMAQMD and SCAQMD emission factors and calculation guidelines. Project-specific input was based on general information provided in Section 1.0, Introduction, input from the client, and default model settings to estimate reasonably conservative conditions. Specific equipment specifications and haul truck trips for three scenarios were provided by the project applicant, Teichert Aggregate Inc., and are included in Section 5.1. Assumptions and details are included in Appendix A.

The project would involve the expansion of the existing quarry onto the adjacent 158-acre parcel to be mined for aggregate material. Preparation of the site would involve the removal of vegetation and

overburden, grading, and removal of topsoil. Given the nature of preparation work required, these activities would be of limited duration. Excavation would be done primarily with explosives, loaders, and excavators and loaded onto off-road haul trucks and transported to the existing processing plant for washing, screening, and crushing. The haul trucks would convey the material a short distance to the processing plant site via internal, unpaved haul roads. The project would provide an average annual production level of approximately 570,000 tons and could reach a maximum annual production of 1,000,000 tons.

The emissions generated from these site preparation and operational activities include:

- Dust (including PM_{10} and $PM_{2.5}$) primarily from fugitive sources such as soil disturbance, processing plant operations, and vehicle travel over unpaved surfaces;

- Combustion emissions of air pollutants (including ROG, NO_X, PM_{10}, $PM_{2.5}$, CO, and So_x) primarily from operation of heavy off-road equipment, explosives combustion, construction worker and haul truck trips

Operational fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, activities may result in generating significant quantities of dust, and as a result, local visibility and PM_{10} and $PM_{2.5}$ concentrations may be adversely affected. In addition, the fugitive dust generated by site preparation would include not only PM_{10} and $PM_{2.5}$, but also larger particles, which would fall out of the atmosphere within several hundred feet of the operation area and could result in nuisance-type impacts.

Operational activities would also result in the emission of pollutants of concern from off-road equipment exhaust, explosive combustion, worker commute trips and haul truck trips. Emission levels would vary depending on the number and type of equipment, duration of use, operating schedules, and the number of workers and haul trucks. Criteria pollutant emissions of ROG and NO_X from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during project operations.

Proposed project NO_X, ROG, PM_{10}, $PM_{2.5}$, CO, and SO_X emissions were estimated for three different operating scenarios (described in Section 5.1.1) for the activities involved in the quarry area, processing plant area, and off-site roads. Table 15 lists the emission sources for each activity.

Table 15
EMISSION SOURCE BY ACTIVITY

Mining Activities	Materials Processing	Off- and On-Site Traffic
Drilling	Off-road Vehicle/Equipment Combustion	Haul Truck Combustion
Explosives Fugitive Dust	Material Stockpiling Wind-blown Dust	Employee Vehicle Combustion
Off-road Vehicle Combustion	Material Un/Loading Fugitive Dust	
Dozing Fugitive Dust	Conveyor Belt Transfer Point	
Material Un/Loading Fugitive Dust	Material Crushing Fugitive Dust	
Material Crushing Fugitive Dust	Material Screening Fugitive Dust	
Material Stockpiling Wind-blown Dust		

The results of these operating scenarios are summarized in Tables 16 through 18 for the proposed project.

Table 16
SCENARIO 1: PEAK DAILY PRODUCTION QUARRY OPERATIONAL EMISSIONS

Emission Source	Criteria Pollutant Emission Levels (lbs/day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Mining Activities	4.29	25.81	44.11	0.07	31.80	23.50
Materials Processing	6.45	37.79	60.20	0.12	156.31	78.09
On- and Off-site Traffic	3.49	17.09	108.85	0.42	3.27	1.53
TOTAL	**14.22**	**80.69**	**213.16**	**0.61**	**191.39**	**103.11**
NSAQMD Significance Threshold	137	n/a	137	n/a	137	n/a
Significant Impact?	*No*	*n/a*	***Yes***	*n/a*	***Yes***	*n/a*

Source: Appendix A
Notes: "Peak production" would be about 4,100 tons per day (12-hour days in place of the 16-hour "double shift" for the "worst case" day scenario.

Table 17
SCENARIO 2: WORST-CASE DAILY PRODUCTION QUARRY OPERATIONAL EMISSIONS

Emission Source	Criteria Pollutant Emission Levels (lbs/day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Mining Activities	5.72	34.42	58.81	0.09	43.46	28.19
Materials Processing	8.60	50.39	80.26	0.16	340.72	134.88
On- and Off-site Traffic	8.09	38.79	253.07	0.97	7.57	3.53
TOTAL	**22.40**	**123.60**	**392.14**	**1.23**	**391.75**	**166.60**
NSAQMD Significance Threshold	137	n/a	137	n/a	137	n/a
Significant Impact?	*No*	*n/a*	***Yes***	*n/a*	***Yes***	*n/a*

Source: Appendix A
Notes: "Worst-case" day production is 10,080 tons per day based on the maximum number of trucks able to be managed on-site. Divided by a maximum annual production of 1,000,000 tons, yields approximately 93 working days.

Table 18
SCENARIO 3: AVERAGE DAILY PRODUCTION QUARRY OPERATIONAL EMISSIONS

Emission Source	Criteria Pollutant Emission Levels (lbs/day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Mining Activities	2.86	17.21	29.41	0.05	27.84	21.96
Materials Processing	4.30	25.19	40.13	0.08	130.04	69.58
On- and Off-site Traffic	2.78	13.71	86.42	0.33	2.60	1.21
TOTAL	**9.93**	**56.12**	**155.96**	**0.46**	**160.48**	**92.75**
NSAQMD Significance Threshold	137	n/a	137	n/a	137	n/a
Significant Impact?	*No*	*n/a*	***Yes***	*n/a*	***Yes***	*n/a*

Source: Appendix A
Notes: Average daily production is assumed to be 3,170 tons per day. All daily average calculations are based off of an "average day" multiplied by 8 hours per day.

As shown in Tables 16 through 18, NO_X and PM_{10} emissions would exceed the NSAQMD thresholds for all three operating scenarios and would be considered a potentially significant impact. The following mitigation measures are prescribed.

Mitigation Measure AQ-02: Diesel control measures including, but not limited to the following, shall be incorporated by Project Applicant into contract specifications:

- To minimize potential diesel emission impacts on nearby receptors (pursuant to NSAQMD Regulation 2, Rule 205, Nuisance), heavy duty diesel equipment shall be properly tuned. A schedule of tune-ups shall be developed and performed for all equipment operating within the project area, particularly for haul and delivery trucks. A log of required tune-ups shall be maintained and a copy of the log shall be submitted to County for review every 2,000 service hours.

- To minimize diesel emission impacts, construction contracts shall require off-road compression ignition equipment operators to reduce unnecessary idling with a two minute time limit.

- On-road and off-road material hauling vehicles shall shut off engines while queuing for loading and unloading for time periods longer that two minutes.

- Off-road diesel equipment shall be fitted with verified diesel emission control systems (e.g., diesel oxidation catalysts) to the extent reasonably and economically feasible.

- Construction equipment shall utilize alternative fuel equipment (i.e., compressed or liquefied natural gas, biodiesel, electric) to the extent reasonably and economically feasible.

Mitigation Measure AQ-03: Dust Control Measures. The Applicant shall comply with NSAQMD Rule 226, which requires implementation of feasible dust control measures which may include, but are not limited to the following:

- Ensure no visible dust emissions occurs beyond the property line;
- Ensure no dust emissions exceeding 20 percent opacity occur anywhere on the property;
- Ensure no offsite increase in ambient PM10 concentrations greater than 50 µg/m3 occur;
- Ensure no track-out exceeding 25 feet from the property occurs;
- Employ a dust control supervisor who has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance;
- Water to maintain soil moisture at 12 percent on haul roads and other active unpaved surfaces that are not chemically stabilized;
- Water to prevent visible dust more than 100 feet from any earth moving or mining activity;
- Utilize watering, dust suppressants, larger aggregate cover, and revegetation in inactive, disturbed areas to prevent wind driven dust;
- Water unpaved roads daily, and limit the speed on unpaved roads to 15 mph;
- Utilize chemical stabilization, watering, covering, and enclosure of storage piles;
- Conduct sweeping of paved roads at the end of each workday shift, utilizing certified sweepers;
- Conduct prompt cleanup of any spilled material and stabilization of any spilled material storage piles at a minimum frequency of daily at the end of each work day;

- Utilize dust suppressants or other dust control methods on conveyors, loading, unloading, or transferring activities;
- Utilize baghouse emission controls on screening and crushing activities or other dust control measures to meet the visible emission limits;
- Conduct chemical stabilization of unpaved haul roads;
- Cover or otherwise stabilize aggregate loads (i.e., loads to remain 6 inches from the upper edge of the container area) to avoid dust emissions from product transport trucks in compliance with California Vehicle Code No. 23114; and
- Utilize wheel washers, rumble grate, and paving of internal roads or use of dust palliatives on roads to eliminate track out.
- Suspend excavation and grading activity when sustained winds make reasonable dust control difficult to implement, e.g., for winds over 25 miles per hour.
- Limit the area subject to blasting, mining, and other operational activity at any one time, as feasible.

Significance after Mitigation: Significant and unavoidable.

6.3 IMPACTS TO SENSITIVE RECEPTORS

The CARB describes sensitive receptors as residences, schools, day-care centers, playgrounds, medical facilities, or other facilities that may house individuals with health conditions (medical patients or elderly persons/athletes/students/children) that may be adversely affected by changes in air quality. The two primary pollutants of concern regarding health effects for residential development are CO and DPM. Implementation of the project may lead to increase in chronic exposure of nearby sensitive receptors to certain toxic air contaminants from various stationary and mobile sources. An analysis of the project's potential to expose sensitive receptors to these pollutants is described below.

Figure 5, Air Quality Sensitive Receptor Locations, presents the location of sensitive receptors within one-quarter mile of the project site. Potentially affected sensitive receptors identified within one-quarter mile radius include recreational users near the southern edge of Boca Reservoir (i.e., boaters, fishermen, campers, cyclists, etc.); the Boca Reservoir's caretaker residence located on Stampede Meadows Road just south of the dam; and the Truckee River RV Park on the south side of I-80 at the Hirschdale Road exit.

6.3.1 Diesel Particulate Matter

Construction activities are sporadic, transitory, and short-term in nature, and once construction activities have ceased, so, too, have emissions from construction activities. DPM is not included as a criteria pollutant; however, is recognized by the State of California as containing carcinogenic compounds. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of cancer exposure, which is defined in the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spots" Program Risk Assessment Guidelines (CAPCOA 1993) as 24 hours per day, 7 days per week, 365 days per year, for 30 years for residences.

DPM would be emitted from heavy equipment used in the construction process. The proposed project would operate a maximum of 30 years for 180 days per year, and the off-site roadway improvement

construction would occur for approximately one month. The off-site roadway improvement construction would be short-term and temporary in nature and therefore would not result in a significant impact. Quarry activity would occur a maximum of 180 working days per year which is well below the CAPCOA threshold of 365 days of exposure. Thus, quarry operations would not result in a significant health risk to surrounding receptors.

Additionally, the CARB Guidance document recommends that sources of hazardous emissions be separated from sensitive receptor land uses (which includes residential homes, schools, medical facilities, etc.), and requires assessment of sensitive receptors located within one-quarter mile (1,320 feet) of the proposed project site. Currently, no residences are located within 1,320 feet of the portion of the haul route along West Hinton Road. Recreational users near the southern edge of Boca Reservoir and visitors staying at the Truckee River RV Park would be temporarily exposed to DPM from passing haul trucks utilizing Stampede Meadows Road and I-80 on- and off-ramps. Visits from recreational and RV Park users are typically short term and exposure to DPM would be limited. Therefore, due to the short-term nature of recreational visits and the temporary exposure from passing haul trucks, impacts to recreational reservoir users and Truckee River RV Park users are less than significant. The Boca Reservoir's caretaker residence would also be exposed to DPM from haul trucks driving on Stampede Meadows Road just south of the dam, however, haul trucks would only operate 180 days per year and would be well below the threshold of 365 days of exposure.

Therefore, because project activity would only occur fifty percent of the year and sensitive receptors are only temporarily exposed to passing haul trucks, the potential project impacts from DPM are considered less than significant and no mitigation is required.

6.3.2 Asbestos

Chrysotile and amphibole asbestos (such as tremolite) occur naturally in certain geologic settings in California, most commonly in association with ultramafic rocks and along associated faults. Asbestos is a known carcinogen, and inhalation of asbestos may result in the development of lung cancer or mesothelioma. Exposing or disturbing rock and soil that contains naturally occurring asbestos can result in the release of fibers to the air and, consequently, public exposure. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos.

A review of the *General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos* (California Division of Mines and Geology, 2000) was conducted. The guide shows that the project site is not located in an area of potential naturally occurring asbestos. Although the mapping is negative, there is the potential for asbestos to be present naturally in the project site and off-site roadway improvement area, and asbestos containing rocks may have been used in the pavement in the off-site roadway improvement area. Ground disturbing activities associated with construction of the off-site roadway improvement area and mining operations in the project site have the potential to expose sensitive receptors to asbestos, if present, which would result in a potentially significant impact and mitigation would be required.

AQ-4 Prior to issuance of the encroachment permit for the off-site roadway improvements and prior to commencing operations in the West Pit, the work area shall be evaluated by a qualified individual to determine the presence/absence of asbestos containing materials. The results of the analyses shall be provided to the Nevada County Department of Environmental Health (NCDEH), Certified Unified Program Agency (CUPA).

If naturally occurring asbestos is found at the project site, the Project Applicant shall prepare an Asbestos Health and Safety Program and an Asbestos Dust Control Plan for approval by CUPA. The Asbestos Health and Safety Program and Asbestos Dust Control Plan may include, but is not limited to, the following:

- Equipment operator safety requirements: protective clothing, breathing apparatuses to prevent inhalation of airborne asbestos fibers,
- Dust mitigation measures: continually water site to prevent airborne dust migration, cover all vehicle that haul materials from the site
- Identification of CUPA-approved disposal areas for all excavated materials.

Significance after Mitigation: Less than significant.

6.3.3 Crystalline Silica

Crystalline silica has not been identified as a toxic air contaminant under the California Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983). There are no similar Federal laws or regulations that list crystalline silica as a hazardous air pollutant or toxic air contaminant. Crystalline silica is subject to Proposition 65, which requires businesses emitting crystalline silica or other listed emissions at levels that exceed the significance risk threshold in Proposition 65, to notify the public of emissions and potential hazards. Crystalline silica is a component of soil, sand, granite and many other minerals. Crystalline silica may become respirable-sized particles when workers chip, cut, drill or grind materials that contain it. If respirable crystalline silica dust enters the lungs, it causes the formation of scar tissue (silicosis) which can be disabling or even fatal, reducing the lungs' ability to take in oxygen and increasing the susceptibility to lung infections like tuberculosis. The non-crystalline form of silica (amorphous silica) is not nearly as toxic, since it usually does not cause the formation of scar tissue in the lungs.

High occupational exposure to crystalline silica has been linked to respiratory problems and in some cases to cancer. Crystalline silica related illnesses historically have been associated with industrial processes such as mining. However, due to stringent health and safety regulations that have been imposed over the years, mining related respiratory illnesses have steadily declined. Due to the presence of a large amount of quartz at the project site, fugitive dust emissions may contain crystalline silica. For crystalline silica emissions, PM_4 is used instead of PM_{10} because the health effects standard is based on PM_4. By analyzing the size distribution of particulate emissions associated with aggregate handling and storage as reported by the USEPA (USEPA AP-42, Chapter 13, Section 2.4-3), the PM_4 to PM_{10} ratio of 40 percent was used to estimate PM_4 emissions. (PM_4 is 40 percent of PM_{10} x 23 percent bulk crystalline silica of bulk rock x 44 percent of ground crystalline silica to PM_4 particles = 4 percent of PM_{10}). As a conservative analysis, it was assumed that four percent of all PM_{10} fugitive dust would be respirable quartz dust. The estimated on-site emissions include all of the emission controls and other emission

reduction strategies as specified by SCAQMD rules. The screens, crushers, and conveyors associated with the aggregate plant would be controlled with a combination of wet material, complete enclosure, or baghouse filters or similar devices. The overall emission control efficiency of this combination is at least 97.5 percent (which was assumed).

Potential cancer risks due to exposure to crystalline silica emissions were estimated using OEHHA's various safe harbor concentrations under California Proposition 65 (OEHHA 2015). The estimated cancer risk due to crystalline silica emissions during operation would be less than 1 in a million. As a conservative analysis it was assumed that four percent of all PM_{10} fugitive dust would be respirable quartz dust (CARB 2001). Based on a proposed safe exposure level published by the OEHHA, the project would not cause a significant health risk from crystalline silica. In addition, Mitigation Measures AQ-2 provide a dust control program that would limit exposure of potential crystalline silica emissions even if they were known to exist on the site. As such, health risks to public, off-site sensitive receptors due to crystalline silica emissions are considered unlikely. Therefore, the health risk from crystalline silica on off-site receptors would be less than significant.

6.3.4 LOCALIZED CO HOT SPOT ANALYSIS

Vehicle exhaust is the primary source of CO. In a rural setting, the highest CO concentrations are generally found within close proximity to congested intersection locations. Under typical meteorological conditions, CO concentrations tend to decrease as distance from the emissions source (i.e., congested intersection) increase. Project-generated traffic has the potential of contributing to localized hotspots of CO off-site. Because CO is a byproduct of incomplete combustion, exhaust emissions are worse when fossil-fueled vehicles are operated inefficiently, such as in stop-and-go traffic or through heavily congested intersections, where the level of service (LOS) is severely degraded.

CARB recommends evaluation of the potential for the formation of locally high concentrations of CO, known as CO "hot spots." To verify that the project would not cause or contribute to a violation of the 1-hour and 8-hour CO standards, an evaluation of the potential for CO "hot spots" was conducted. The TIA evaluated whether or not there would be a decrease in the Level of Service (LOS) at the roadways and/or intersections affected by the proposed project. The potential for CO "hot spots" was evaluated based on the results of the TIA. The Transportation Project-Level Carbon Monoxide Protocol (California Department of Transportation [Caltrans] 1998) was followed to determine whether a CO "hot spot" is likely to form due to project-generated traffic. In accordance with the Protocol, CO "hot spots" are typically evaluated when (a) the LOS of an intersection or roadway decreases to a LOS E or worse; (b) signalization and/or channelization is added to an intersection; and (c) sensitive receptors such as residences, commercial developments, schools, hospitals, etc. are located in the vicinity of the affected intersection or roadway segment.

The TIA evaluated three intersections in the project vicinity to evaluate the Existing Condition (Year 2017), and Future Conditions (Year 2037). Based on the TIA, all intersection movements would operate at an acceptable LOS C or better. Since the LOS would not be degraded to E or worse at any intersections in the project vicinity, the project would not result in the formation of CO "hot spots."

6.4 ODORS

Odor impacts generally occur from either siting a new odor source (e.g., the project includes a proposed odor source near existing sensitive receptors), or siting a new receptor (e.g., the project includes

proposed sensitive receptors near an existing odor source). Although offensive odors from stationary sources rarely cause any physical harm, they still remain unpleasant and can lead to public distress, generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source, wind speed and direction, and the sensitivity of receptors. Generally, increasing the distance between the receptor and the source will mitigate odor impacts.

According to the NSAQMD primary screening process, potential land use conflicts, such as odors or exposure of sensitive receptors to odors, should be addressed as early as possible in the development review process (NSAQMD 2016). An in-depth review is required of any project with potential to emit odors which my impact a considerable number of persons, leading to a public nuisance. Common land uses that have the potential to generate substantial odor complaints include wastewater treatment plants, landfills or transfer stations, composting facilities, confined animal facilities, food manufacturing, and chemical plants.

The project does not include any of these land uses or similar land uses. Diesel truck emissions could also be an odor source. However, since trucks would pass by the nearest receptors without stopping, and would not idle their engines nearby, the exhaust emissions and associated odors would disperse before affecting a substantial number of people. Therefore, the project would not create objectionable odors that would affect a substantial number of people, and odor impacts would be less than significant.

7.0 GREENHOUSE GAS IMPACT ANALYSIS

This section evaluates potential impacts of the proposed project related to the generation of GHG emissions. Complete modeling results are included as Appendix A of this report.

7.1 CONSISTENCY WITH LOCAL PLANS

NSAQMD requires GHG emissions to be quantified for decision-makers and the public to consider, however does not have established thresholds of significance for greenhouse gases (NSAQMD 2016). Proposed project emissions are included in this report for informational purposes.

The Nevada County General Plan, *Goal EP-4.3 and Goal EC-8.2,* encourages reduction of greenhouse gas emissions for construction projects. The proposed project would result in a net decrease of GHG emissions by avoiding emissions from aggregate transport from other, more distant sources (further analysis provided in Section 7.3). Additionally, emissions of GHGs related to the construction of the project would last a maximum of 30 years and thus would be temporary. Therefore, the proposed project would be consistent with local plans.

7.2 PROJECT GHG EMISSIONS

7.2.1 Construction and Site Preparation

Roadway Improvement GHG Emissions

The roadway improvement GHG emissions were estimated separately for the sources of construction GHG emissions. Sources include emissions associated with: (1) grubbing and land clearing; (2) grading and excavation; (3) drainage, utilities and subgrade; and (4) paving. Roadway improvements would result in a maximum of 22 acres of disturbed land over one month. Construction includes widening the existing 20- to 24-foot wide pavement to 32 feet wide, constructing new shoulders as needed to provide 1-foot-wide dirt shoulders along the entire length of the segment (1.3 miles), constructing three vehicle pullout areas along the segment, and sight distance improvements on approximately 29,200 square feet (14,100 square foot area and a 15,100 square foot area) of land at the Stampede Meadows Road and West Hinton Road intersection. The analysis includes default model settings to estimate reasonably conservative conditions. Assumptions and model output are included in Appendix A.

The GHG emissions related to the off-site roadway improvement construction result from heavy equipment operation, fugitive dust and land clearing are summarized in Table 19 below. The majority of emissions are generated during grading and excavation and the installation of drainage and utilities. GHG emissions from construction would be temporary over a one-month period and would contribute approximately 4.90 tons of CO_2e per year over the maximum 30-year lifetime of the project.

Table 19
ESTIMATED ROAD IMPROVEMENT RELATED GHG EMISSIONS

Phase	Annual Emissions (metric tons/year)
	CO_2e
Grubbing & Land Clearing	5.76
Grading & Excavation	85.44
Drainage/Utilities & Subgrade	43.86
Paving	11.92
TOTAL	**146.98**
Amortized[1] Emissions	*4.90*

Source: Appendix A
[1] Amortized over the maximum 30-year lifetime of the quarry operations

Site Preparation

Site preparation would occur prior to quarry operations. Preparation of the site would involve the removal of vegetation and overburden, grading, and removal of topsoil. All trees within the footprint of the area to be mined would be removed through the use of both heavy equipment and hand tools. Existing vegetation would not be removed until work is imminent. Site Preparation, for a conservative analysis, assumes vehicles would operate for a maximum 16 hours per day. As depicted in Table 20, GHG emissions related to site preparation result from blasting and use of off-road equipment. Site preparation would be temporary over a 93-day period and would contribute approximately 594 metric tons of CO_2e per year over the maximum 30-year lifetime of the project.

Table 20
ESTIMATED SITE PREPARATION RELATED GHG EMISSIONS

Phase	Annual Emissions (metric tons/year)
	CO_2e
Blasting	77
Off-road Equipment	299
On-road Vehicles	22
Vegetation Burning	17,411
TOTAL	**17,809**
Amortized[1] Emissions	*594*

Source: Appendix A
[1] Amortized over the maximum 30-year lifetime of the quarry operations

7.2.2 Operational GHG Emissions

GHG emissions during on-site operation of the quarry are associated with stationary and mobile sources from the process of mining and producing the aggregate. More specifically, on-site GHG emissions are released during the following steps: (1) extraction of rock using blasting and excavation; (2) transport of rock to crushing and screening area; (3) crushing and screening to produce aggregate; (4) transport of aggregate via haul trucks; and (5) employee vehicle travel.

Quarry area emission sources would result from during blasting and off-road vehicle combustion during mining operations. During processing plant operations, off-road vehicle and equipment combustion are the main sources of all GHG emissions. The majority of the GHG emissions arise from haul truck transporting aggregate on off-site roads and are primarily due to haul truck fuel combustion, accounting for approximately 2,841 MT of CO_2 per year.

The project generated operational GHG emissions are summarized in Table 21, *Annual Average Quarry GHG Emissions,* below. GHG emissions associated with quarry operation are estimated at 4,354 MT of CO_2e. As described above, site preparation and roadway improvement construction were amortized over the 30-year lifetime of the quarry. Therefore, the proposed project, would contribute a total 4,953 MT of CO_2e per year.

Table 21
ANNUAL AVERAGE QUARRY GHG EMISSIONS

Source	Annual Emissions ($MT CO_2e$)
Haul Trucks Transporting Aggregate	2,841
On-Site Equipment	981
Electricity Use	281
Removal of Vegetation	231
Employee Travel	19
Blasting	2
Quarry Operation Total	***4,354***
Amortized Roadway Construction[1]	5
Amortized Site Preparation[1]	594
TOTAL	**4,953**

Source: Appendix A
[1] Amortized over the maximum 30-year lifetime of the quarry operations
Note: totals may not sum due to rounding.

7.3 BASELINE SCENARIO

As previously described, there are various construction projects in the Tahoe-Truckee area that need aggregate, such as repaving of I-80, and general public and private road construction and maintenance activities. This level of demand would not change if this proposed project is approved or denied. Without the proposed project, local demand for aggregate would likely be met from other regional sources.

To provide an estimate of the amount of GHG emissions that would be reduced from construction of the project, emissions from haul trucks were estimated based on trucks traveling to the Reno/Sparks area for aggregate. This location is approximately 40 miles from the Boca Quarry project site. Therefore, a single 18-ton truck load of aggregate delivered from Reno/Sparks area would travel 60 miles instead of 20 miles with the proposed project.

Due to the lack of available data for the out-of-county aggregate truck trips, emissions were estimated based on the assumptions that the demand for aggregate supply would remain at the same level as Average Daily Production (Scenario 3 in Section 5.1.2). Therefore, to meet local demand, it is assumed 3,170 tons of aggregate would be hauled per day, yielding 570,000 tons per year. With a truck capacity of 18 tons, this would generate 352 one-way trips per day and 63,360 one-way trips per year (352 trips per day over 180 working days). The additional 40 miles per trip would result in an increase in VMT by 2,536,000 miles per year for all haul truck trips, resulting in 4,032 MT of CO_2e per year.

The total emissions for the proposed project are 4,953 MT of CO_2e per year. The project would provide a source of aggregate for regional demand which would be approximately 40 miles closer than what exists currently. Therefore, due to the shorter trip length of the proposed project, the project would only generate 921 MT of CO_2e per year when compared to the offset of 4,953MT of CO_2e per year. As

discussed in Section 8.2, GHG emissions are cumulative in nature and therefore an increase of 921 MT of CO_2e per year is nominal when compared to regional, state, and global GHG emissions.

The project would result in a nominal increase in CO_2e emissions when compared to existing alternative locations. Therefore, impacts relating to GHG emissions would be less than significant.

8.0 CUMULATIVE IMPACTS

8.1 AIR QUALITY

Expansion and operation of the proposed project would result in a cumulative increase of criteria pollutant emissions.

Air pollution is largely considered a cumulative impact, because no single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

A cumulative impact occurs when two or more individual effects, considered together, are considerable or would compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant impacts, meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. The NSAQMD is currently designated non-attainment for the federal and the California standards for 8-hour ozone. Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

The Boca Quarry is an active quarry operation and proposed production volumes after expansion are expected to result in a significant incremental increase in air pollutant emissions with implementation of the project. Based on the above considerations, the project would result in significant adverse cumulative effects with regard to air quality.

Mitigation Measure: Refer to Mitigation Measures AQ-02 through AQ-03 in Section 6.2.2 above.

Significance after Mitigation: Significant and unavoidable.

8.2 GREENHOUSE GASES

Similar to regulated air pollutants, GHG emissions and global climate change also represent cumulative impacts. The GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. Climate change impacts may include an increase in extreme heat days, higher concentrations of air pollutants, sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts. The combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature. Therefore, the analysis completed is cumulative in nature.

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