AIR QUALITY AND GREENHOUSE GAS IMPACT ANALYSIS

TENTATIVE TRACT MAP 20088

CITY OF VICTORVILLE

SAN BERNARDINO COUNTY, CALIFORNIA

LSA

October 2017

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TENTATIVE TRACT MAP 20088

CITY OF VICTORVILLE

SAN BERNARDINO COUNTY, CALIFORNIA

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LSA Project No. ALP1701

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EXECUTIVE SUMMARY

LSA was retained to prepare an air quality and greenhouse gas (GHG) impact analysis for the proposed project area in the City of Victorville (City) in San Bernardino County (County), California. The project area consists of vacant property east of State Highway 395 between Seneca Road and Villa Street.

The project, Tentative Tract Map (TTM) 20088, would develop an up to 64-lot subdivision, designated as a single-family residential project in the City.

Regional emissions during project construction, calculated with the California Emissions Estimator Model (CalEEMod; Version 2016.3.1), would not exceed the criteria pollutant thresholds established by the Mojave Desert Air Quality Management District (MDAQMD). Compliance with MDAQMD Rules and Regulations during construction will reduce construction-related air quality and GHG impacts from fugitive dust emissions and construction equipment emissions. Standard dust suppression measures have been identified for short-term construction to meet the MDAQMD emissions thresholds.

Pollutant emissions from project operation, also calculated with CalEEMod, would not exceed the MDAQMD thresholds for criteria pollutants. Historical air quality data show that existing carbon monoxide (CO) levels for the project area and the general vicinity do not exceed either State or federal ambient air quality standards. The proposed project would not result in any significant increase in CO concentrations in the project vicinity. Therefore, no significant impact on local CO levels would occur.

The proposed project is located in San Bernardino County, which is among the counties found to have ultramafic rock in their soils. However, according to the California Geological Survey, no ultramafic rock has been found in the vicinity of the project site in the past 20 years. By following standard nuisance and dust control measures as required by MDAQMD Rules 402 and 403, any naturally occurring asbestos (NOA) that might be disturbed would not become airborne. Therefore, the potential risk for NOA during project construction is less than significant.

The potential of the project to affect global climate change (GCC) is also addressed. Short-term construction and long-term operational emissions of the principal GHGs, including carbon dioxide and methane, are quantified and their significance relative to the California Air Resources Board (ARB) Scoping Plan is discussed. The proposed project would not exceed the MDAQMD GHG emissions thresholds of 100,000 tons per year of CO_2e, and would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

The evaluation was prepared in conformance with appropriate standards, using procedures and methodologies in the MDAQMD *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* (2016). Air quality data posted on the ARB website and on the United States Environmental Protection Agency website are included to document the local air quality environment.

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ACRONYM LIST

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AAQS	ambient air quality standards
AB	Assembly Bill
ADT	average daily trip
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
Basin	Mojave Desert Air Basin
BAU	business-as-usual
CAA	Clean Air Act
CAAQS	California ambient air quality standards
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CAT	Climate Action Team
CCAA	California Clean Air Act
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CH_4	methane
City	City of Victorville
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
CO_2e/yr	carbon dioxide equivalents per year
County	County of San Bernardino
DPM	particulate matter from diesel-fueled engines
EO	Executive Order
EPA	United States Environmental Protection Agency
GCC	global climate change
GHG	greenhouse gas
GWP	Global Warming Potential
H_2S	hydrogen sulfide
HFCs	hydrofluorocarbons

IPCC	Intergovernmental Panel on Climate Change
MDAQMD	Mojave Desert Air Quality Management District
MMT	million metric tons
MMT CO_2e	million metric tons of carbon dioxide equivalents
mph	miles per hour
MPO	Metropolitan Planning Organization
MT	metric tons
MT CO_2e/yr	metric tons of carbon dioxide equivalents per year
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NHTSA	National Highway Traffic Safety Administration
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NO_X	nitrogen oxides
O_3	ozone
PFCs	perfluorocarbons
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
REL	Reference Exposure Level
ROC	reactive organic compound
ROG	reactive organic gas
SANBAG	San Bernardino Associated Governments
SB	Senate Bill
SCAG	Southern California Association of Governments
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
TAC	toxic air contaminant
TTM	tentative track map
UNFCCC	United Nations Framework Convention on Climate Change
VOC	volatile organic compound

PROJECT DESCRIPTION

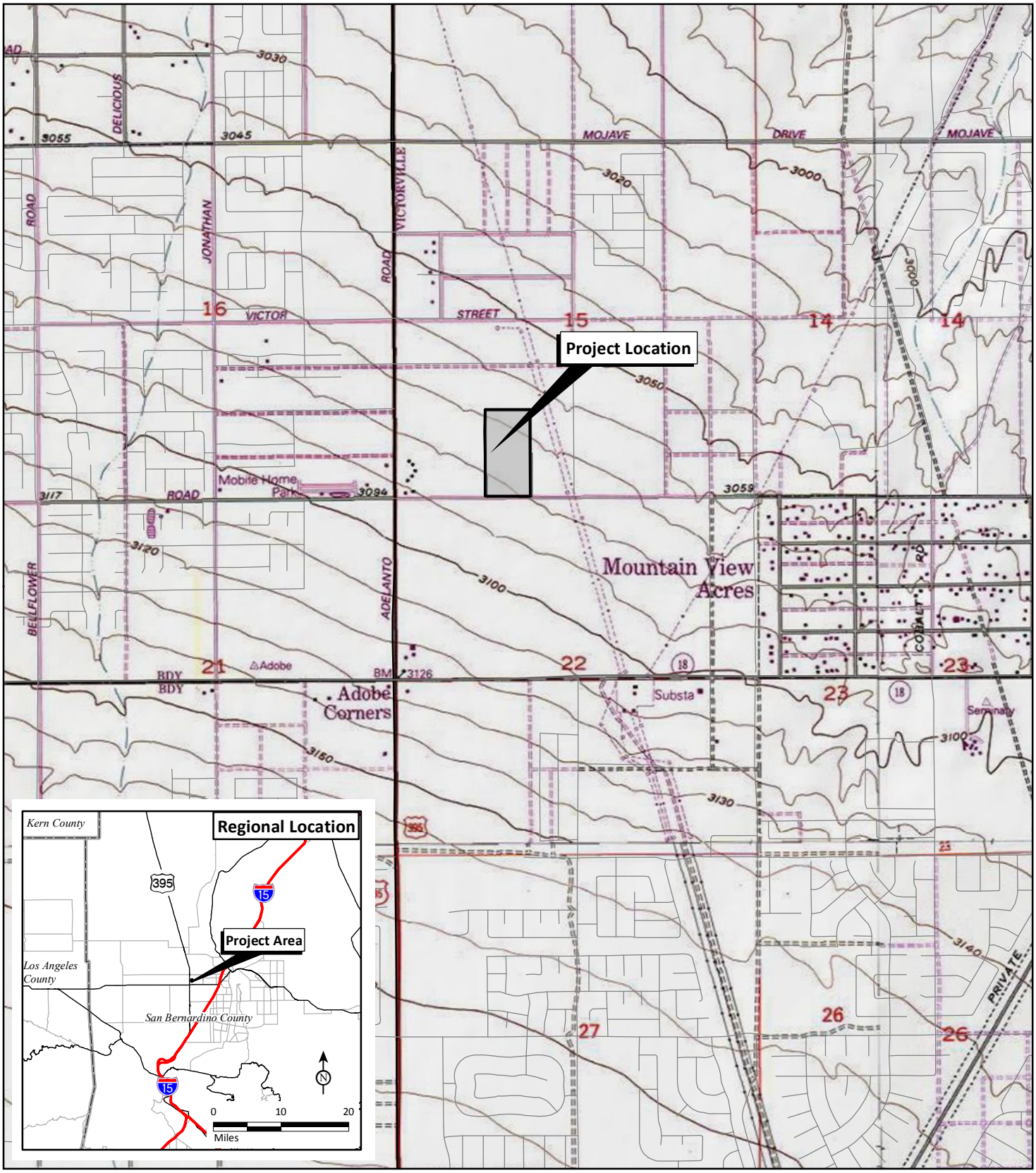
INTRODUCTION

This air quality and greenhouse gas (GHG) impact analysis has been prepared to evaluate the potential air quality and GHG impacts and mitigation measures associated with Tentative Tract Map (TTM) 20088 consisting of the development of up to 64 lots on an area zoned for Single Family Residential – Transitional in the City of Victorville (City) in San Bernardino County (County), California. This report provides air quality and climate change impact analysis by comparing mass emissions for various scenarios in the project area with thresholds and evaluating potential project design features that could be used to mitigate potential impacts. Guidelines identified by the Mojave Desert Air Quality Management District (MDAQMD) in its *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* (MDAQMD 2016) were followed in this air quality and GHG impact analysis. The GHG impact analysis also looks at the project's compliance with the City's Climate Action Plan.

PROJECT DESCRIPTION

The project area is located in the City of Victorville, in western San Bernardino County. The project area consists of vacant property east of State Highway 395, between Seneca Road and Villa Street, as shown in Figure 1. The project site is currently designated under the General Plan as Low Density Residential. Current zoning in the entire project area is Single Family Residential – Transitional with four dwelling units per acre.

The project would develop a 64 lot single-family residential subdivision in the City.



LSA

FIGURE 1

N

0 1000 2000
FEET

Victorville 20 Acre

Regional and Project Location

SOURCE: USGS 7.5' Quads: Adelanto & Victorville, 1993, Baldy Mesa, 1988, Hesperia, 1980, CA; ESRI Streetmap, 2013.

M:\PROPOSAL\CULTURAL\Victorville\Victorville 20 acre\G\fig1_RegLoc.mxd (9/15/2017)

PROJECT SETTING

REGIONAL AIR QUALITY

The project site is in the desert portion of San Bernardino County, California, which is part of the Mojave Desert Air Basin (Basin) and is under the jurisdiction of the MDAQMD. The air quality assessment for the proposed project includes estimating emissions associated with short-term construction and long-term operation of the proposed project.

A number of air quality modeling tools are available to assess the air quality impacts of projects. In addition, certain air districts (e.g., MDAQMD) have created guidelines and requirements to conduct air quality analyses. The MDAQMD's current guidelines, included in its *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* (2016), were followed in the assessment of air quality impacts for the proposed project.

Both the State of California and the federal government have established health-based ambient air quality standards (AAQS) for seven air pollutants. As detailed in Table A, these pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in size (PM_{10}), particulate matter less than 2.5 microns in size ($PM_{2.5}$), and lead. In addition, the State has set standards for sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table B summarizes the primary health effects and sources of common air pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these health effects will not occur unless the standards are exceeded by a large margin or for a prolonged period of time. State AAQS are more stringent than federal AAQS. Among the pollutants, O_3 and particulate matter ($PM_{2.5}$ and PM_{10}) are considered regional pollutants, while the others have more localized effects.

The California Clean Air Act (CCAA) provides the MDAQMD and other air districts with the authority to manage transportation activities at indirect sources. Indirect sources of pollution are generated when minor sources collectively emit a substantial amount of pollution. Examples of this would be the motor vehicles at an intersection, a mall, and on highways. The MDAQMD also regulates stationary sources of pollution throughout its jurisdictional area. Direct emissions from motor vehicles are regulated by the California Air Resources Board (ARB).

Table A: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone[8] (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM_{10})[9]	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)[9]	24-Hour	–	–	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	–	Non-Dispersive Infrared Photometry (NDIR)
	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)		–	–	
Nitrogen Dioxide (NO_2)[10]	1-Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	–	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.03 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1-Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3-Hour	–		–	0.5 ppm (1300 µg/m^3)	
	24-Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[11]	–	
Lead (Pb)[12,13]	30-Day Average	1.5 µg/m^3	Atomic Absorption	–	–	High Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m^3 (for certain areas)[13]	Same as Primary Standard	
	Rolling 3-Month Average	–		0.15 µg/m^3		
Visibility-Reducing Particles[14]	8-Hour	See footnote 14.	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: Ambient Air Quality Standards (ARB 2016). Website: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed September 2017.
Footnotes are provided on the following page.

[1] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter (PM_{10}, $PM_{2.5}$, and visibility-reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current national policies.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

[7] Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

[8] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 ppm to 0.070 ppm.

[9] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[10] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of ppb. California standards are in units of ppm. To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb are identical to 0.100 ppm.

[11] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[12] The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[13] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[14] In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

°C = degrees Celsius
ARB = California Air Resources Board
EPA = United States Environmental Protection Agency
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
ppb = parts per billion
ppm = parts per million

Table B: Summary of Health Effects of the Major Criteria Air Pollutants

Pollutant	Health Effects	Examples of Sources
Particulate matter ($PM_{2.5}$ and PM_{10}: less than or equal to 2.5 or 10 microns, respectively)	• Hospitalizations for worsened heart diseases • Emergency room visits for asthma • Premature death	• Cars and trucks (especially diesels) • Fireplaces, wood stoves • Windblown dust from roadways, agriculture, and construction
Ozone (O_3)	• Cough, chest tightness • Difficulty taking a deep breath • Worsened asthma symptoms • Lung inflammation	• Precursor sources:[1] motor vehicles, industrial emissions, and consumer products
Carbon monoxide (CO)	• Chest pain in heart patients[2] • Headaches, nausea[2] • Reduced mental alertness[2] • Death at very high levels[2]	• Any source that burns fuel, such as cars, trucks, construction and farming equipment, and residential heaters and stoves
Nitrogen dioxide (NO_2)	• Increased response to allergens	• See carbon monoxide sources
Toxic air contaminants	• Cancer • Chronic eye, lung, or skin irritation • Neurological and reproductive disorders	• Cars and trucks (especially diesels) • Industrial sources such as chrome platers • Neighborhood businesses such as dry cleaners and service stations • Building materials and products

Source: California Air Resources Board. ARB Fact Sheet: Air Pollution and Health. Reviewed December 2, 2009. Website: http://www.arb.ca.gov/research/health/fs/fs1/fs1.htm, accessed September 2017.

[1] Ozone is not generated directly by these sources. Rather, chemicals emitted by these precursor sources react with sunlight to form ozone in the atmosphere.

[2] Health effects from carbon monoxide exposures occur at levels considerably higher than ambient.

Climate/Meteorology

The proposed project is in the Mojave Desert Air Basin, which is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the Basin come from the west and southwest. These prevailing winds are due to the proximity of the Basin to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in Southern California by differential heating are channeled through the Basin. The Basin is separated from the Southern California coastal and central California valley regions by mountains (the highest elevation is approximately 10,000 feet), whose passes form the main channels for these air masses. The Mojave Desert is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriel Mountains by the Cajon Pass (4,200 feet).

Air quality in the project vicinity is not only affected by various emission sources (e.g., mobile and industry), but also by atmospheric conditions (e.g., wind speed, wind direction, temperature, and rainfall). During the summer, the Basin is generally influenced by a Pacific Subtropical High cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The Basin is rarely influenced by cold air masses moving south from Canada and Alaska, because these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The Basin averages between 3 and 7 inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation). The Basin is classified as a dry-hot desert climate (BWh), with portions classified as dry-very hot desert

(BWhh), to indicate that at least 3 months have maximum average temperatures over 100.4 degrees Fahrenheit (°F).

Description of Global Climate Change and Its Sources

Global climate change (GCC) is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other significant changes in climate (e.g., precipitation or wind) that last for an extended period of time. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures.

Climate change refers to any change in measures of weather (e.g., temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from natural factors (e.g., changes in the sun's intensity), natural processes in the climate system (e.g., changes in ocean circulation), or human activities (e.g., the burning of fossil fuels, land clearing, or agriculture). The primary observed effect of GCC has been a rise in the average global tropospheric[1] temperature of 0.36°F per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling shows that further warming may occur, which may induce additional changes in the global climate system during the current century. Changes to the global climate system, ecosystems, and the environment of California could include higher sea levels, drier or wetter weather, changes in ocean salinity, changes in wind patterns, or more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and increased intensity of tropical cyclones. Specific effects in California might include a decline in the Sierra Nevada snowpack, the erosion of California's coastline, and seawater intrusion in the San Joaquin Delta.

Global surface temperatures have risen by 1.33°F ±0.32°F over the last 100 years (1906 to 2005). The rate of warming over the last 50 years is almost double that over the last 100 years (Intergovernmental Panel on Climate Change [IPCC] 2013). The latest projections, based on state-of-the-art climate models, indicate that temperatures in California are expected to rise 3°F–10.5°F by the end of the century (State of California 2013). The prevailing scientific opinion on climate change is that "most of the warming observed over the last 60 years is attributable to human activities" (IPCC 2013). Increased amounts of carbon dioxide (CO_2) and other GHGs are the primary causes of the human-induced component of warming. The observed warming effect associated with the presence of GHGs in the atmosphere (from either natural or human sources) is often referred to as the greenhouse effect.[2]

[1] The troposphere is the zone of the atmosphere characterized by water vapor, weather, winds, and decreasing temperature with increasing altitude.

[2] The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the amount of heat that escapes, GHGs like CO_2, CH_4, and N_2O in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced GCC are:[1]

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur hexafluoride (SF_6).

Over the last 200 years, human activities have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, which some scientist believe can cause GCC. While GHGs produced by human activities include naturally occurring GHGs (e.g., CO_2, CH_4, and N_2O), some gases (e.g., HFCs, PFCs, and SF_6) are completely new to the atmosphere. Certain other gases (e.g., water vapor) are short-lived in the atmosphere compared to these GHGs that remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is generally excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes (e.g., oceanic evaporation). For the purposes of this air quality and GHG impact analysis, the term "GHGs" will refer collectively to the six gases identified above.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. GWP is based on several factors, including the relative effectiveness of a gas in absorbing infrared radiation and the length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG. The definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of metric tons (MT; approximately 1.1 standard tons) of "CO_2 equivalents" (CO_2e). For example, N_2O is 265 times more potent at contributing to global warming than CO_2. Table C identifies the GWP for each type of GHG analyzed in this report.

Table C: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-year Time Horizon)
Carbon Dioxide (CO_2)	~100	1
Methane (CH_4)	12	28
Nitrous Oxide (N_2O)	121	265

Source: First Update to the Climate Change Scoping Plan: Building on the Framework (ARB 2014). Website: http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf, accessed September 2017.

[1] Carbon dioxide (CO_2) has a variable atmospheric lifetime and cannot be readily approximated as a single number.

[1] The GHGs listed are consistent with the definition in Assembly Bill 32 (Government Code 38505), as discussed later in this section.

Carbon Dioxide

In the atmosphere, carbon generally exists in its oxidized form as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals, and plants; volcanic outgassing; decomposition of organic matter; and evaporation from the oceans. Human-caused sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. The Earth maintains a natural carbon balance, and when concentrations of CO_2 are upset, the system gradually returns to its natural state through natural processes. Natural changes to the carbon cycle work slowly, especially compared to the rapid rate at which humans are adding CO_2 to the atmosphere. Natural removal processes (e.g., photosynthesis by land- and ocean-dwelling plant species) cannot keep pace with this extra input of human-made CO_2. Consequently, the gas is building up in the atmosphere. The concentration of CO_2 in the atmosphere has risen approximately 30 percent since the late 1800s (California Environmental Protection Agency [CalEPA] 2006).

The transportation sector remains the largest source of GHG emissions in 2012 with 36 percent of California's GHG emission inventory. The largest emissions category within the transportation sector is on-road, which consists of passenger vehicles (cars, motorcycles, and light-duty trucks) and heavy duty trucks and buses. Emissions from on-road constitute over 92 percent of the transportation sector total. Industry and electricity generation were California's second- and third-largest categories of GHG emissions, respectively.

Methane

CH_4 is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources of CH_4 include fires, geologic processes, and bacteria that produce CH_4 in a variety of settings (most notably, wetlands) (United States Environmental Protection Agency [EPA] 2010). Anthropogenic sources include rice cultivation, livestock, landfills and waste treatment, biomass burning, and fossil fuel combustion (e.g., burning of coal, oil, and natural gas). As with CO_2, the major removal process of atmospheric CH_4—a chemical breakdown in the atmosphere—cannot keep pace with source emissions, and CH_4 concentrations in the atmosphere are increasing.

Nitrous Oxide

N_2O is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. N_2O is also a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion sources emit N_2O. The quantity of N_2O emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California.

Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride

HFCs are primarily used as substitutes for O_3-depleting substances regulated under the Montreal Protocol.[1] PFCs and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry, which is active in California, has led to greater use of PFCs. However, there are no known project-related emissions of these three GHGs; therefore, these substances are not discussed further in this analysis.

Emissions Sources and Inventories

An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of GHGs is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, national, California, and local GHG emission inventories. However, because GHGs persist for a long time in the atmosphere (see previously referenced Table C), accumulate over time, and are generally well mixed, their impact on the atmosphere and climate cannot be tied to a specific point of emission.

Global Emissions

Worldwide emissions of GHGs in 2012 totaled 29 billion MT CO_2e per year (CO_2e/yr) (United Nations Framework Convention on Climate Change [UNFCCC] 2015). Global estimates are based on country inventories developed as part of the programs of the UNFCCC.

United States Emissions

In 2014, the United States emitted approximately 6.87 billion MT CO_2e. Total United States emissions have increased by 7.4 percent from 1990 to 2014, and emissions increased from 2013 to 2014 by 1 percent. In 2014, relatively cool winter conditions led to an increase in fuels for the residential and commercial sectors for heating. Additionally, transportation emissions increased as a result of a small increase in vehicle miles traveled and fuel use across on-road transportation modes. Industrial production also increased across multiple sectors, resulting in slight increases in industrial sector emissions. Lastly, since 1990, United States emissions have increased at an average annual rate of 0.3 percent (EPA 2016b).

State of California Emissions

According to ARB emission inventory estimates, California emitted approximately 441.5 million metric tons of CO_2e (MMT CO_2e) in 2014 (ARB 2016b). This is a decrease of 2.8 MMT CO_2e from 2013 and a 9.4 percent decrease since 2004 (ARB 2016b).

The ARB estimates that transportation was the source of approximately 36 percent of the State's GHG emissions in 2014, followed by electricity generation (both in-State and out-of-State) at 20 percent and industrial sources at 21 percent. The remaining sources of GHG emissions were

[1] The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for O_3 depletion.

residential and commercial activities at 9 percent, agriculture at 8 percent, high-GWP gases at 4 percent, and recycling and waste at 2 percent (ARB 2016c).

The ARB is responsible for developing the State GHG Emission Inventory. This inventory estimates the amount of GHGs emitted to and removed from the atmosphere by human activities in the State and supports the Assembly Bill (AB) 32 Climate Change Program. The ARB's current GHG emission inventory covers the years 1990–2013 and is based on fuel use, equipment activity, industrial processes, and other relevant data (e.g., housing, landfill activity, and agricultural lands).

The ARB staff has projected statewide unregulated GHG emissions for 2020 at 509 MMT CO_2e, which represents the emissions that would be expected to occur in the absence of any GHG reduction actions. GHG emissions from the transportation and electricity sectors as a whole are expected to increase but remain at approximately 30 percent and 32 percent of total CO_2e emissions, respectively (ARB 2014).

Air Pollution Constituents and Attainment Status

The ARB coordinates and oversees both State and federal air pollution control programs in California. The ARB oversees activities of local air quality management agencies and maintains air quality monitoring stations throughout the State in conjunction with the EPA and local air districts. The ARB has divided the State into 15 air basins based on meteorological and topographical factors of air pollution. Data collected at these stations are used by the ARB and EPA to classify air basins as attainment, nonattainment, nonattainment-transitional, or unclassified, based on air quality data for the most recent three calendar years compared with the AAQS. Attainment areas may be:

- **Attainment/Unclassified** ("Unclassifiable" on some lists), which have never violated the air quality standard of interest or do not have enough monitoring data to establish attainment or nonattainment status; or
- **Attainment-Maintenance** (National Ambient Air Quality Standards [NAAQS] only), which violated an NAAQS that is currently in use (was nonattainment) in or after 1990, but now attains the standard and is officially redesignated to attainment by the EPA with a Maintenance State Implementation Plan (SIP); or
- **Attainment** (usually only for California Ambient Air Quality Standards [CAAQS], but sometimes for NAAQS), which have adequate monitoring data to show attainment, have never been nonattainment, or, for NAAQS, have completed the official maintenance period.

Nonattainment areas are imposed with additional restrictions as required by the EPA. The air quality data are also used to monitor progress in attaining air quality standards. Table D lists the attainment status for the criteria pollutants in the Basin.

Table D: Attainment Status of Criteria Pollutants in the Mojave Desert Air Basin

Pollutant	State	Federal
O_3 1-hour	Nonattainment	N/A
O_3 8-hour	Nonattainment	Attainment/Nonattainment/Unclassified
PM_{10}	Nonattainment	Nonattainment

Table D: Attainment Status of Criteria Pollutants in the Mojave Desert Air Basin

Pollutant	State	Federal
$PM_{2.5}$	Nonattainment/Unclassified	Attainment/Unclassified
CO	Attainment	Attainment/Unclassified
NO_2	Attainment	Attainment/Unclassified
SO_2	Attainment	Unclassified
Lead	Attainment[1]	Attainment/Unclassified
All Others	Attainment/Nonattainment/Unclassified	Unclassified

Source: California Air Resources Board. Air Quality Standards and Area Designations. Reviewed May 5, 2016. Website: http://www.arb.ca.gov/desig/desig.htm, accessed September 2017.

CO = carbon monoxide
N/A = not applicable
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
SO_2 = sulfur dioxide

Ozone

O_3 (smog) is formed by photochemical reactions between nitrogen oxides (NOx) and reactive organic gases (ROGs) rather than being directly emitted. O_3 is a pungent, colorless gas typical of Southern California smog. Elevated O_3 concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors (e.g., the sick, the elderly, and young children). O_3 levels peak during summer and early fall. The entire Basin is designated as a nonattainment area for the State 1-hour and 8-hour O_3 standards. The EPA has designated the northern and eastern portions of the Basin as "Unclassified/Attainment" regarding the 8-hour O_3 standard. However, the southwestern portion of the Basin is classified as "Nonattainment" (MDAQMD 2009).

Carbon Monoxide

CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. CO is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. The entire Basin is in attainment for the State standards for CO. The Basin is designated as an "Attainment/Unclassified" area under the federal CO standards.

Nitrogen Oxides

Nitrogen dioxide (NO_2), a reddish brown gas, and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as nitrogen oxides, or NOx. NOx is a primary component of the photochemical smog reaction. NOx also contributes to other pollution problems, including a high concentration of fine particulate matter ($PM_{2.5}$), poor visibility, and acid deposition (i.e., acid rain). NO_2 decreases lung function and may reduce resistance to infection. The entire Basin is designated as nonattainment for the State NO_2 standard and as an "Attainment/Unclassified" area under the federal NO_2 standard.

Sulfur Dioxide

SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels. SO_2 irritates the respiratory tract, can

injure lung tissue when combined with fine particulate matter ($PM_{2.5}$), and reduces visibility and the level of sunlight. The entire Basin is in attainment for the State standards for SO_2. The Basin is designated as an "Unclassified" area under the federal SO_2 standards.

Lead

Lead is found in old paints and coatings, plumbing, and a variety of other materials. Once in the bloodstream, lead can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of lead. The entire Basin is in attainment for the State standards for lead. The Basin is designated as an "Attainment/Unclassified" area under the federal lead standards.

Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles (PM_{10}) derive from a variety of sources, including windblown dust and grinding operations. Fuel combustion and resultant exhaust from power plants and diesel buses and trucks are primarily responsible for fine particle ($PM_{2.5}$) levels. Fine particles can also be formed in the atmosphere through chemical reactions. PM_{10} can accumulate in the respiratory system and aggravate health problems (e.g., asthma). The EPA's scientific review concluded that $PM_{2.5}$, which penetrates deeply into the lungs, is more likely than PM_{10} to contribute to the health effects listed in a number of recently published community epidemiological studies at concentrations that extend well below those allowed by the current PM_{10} standards. These health effects include premature death and increased hospital admissions and emergency room visits (primarily among the elderly and individuals with cardiopulmonary disease), increased respiratory symptoms and disease (in children and individuals with cardiopulmonary disease [e.g., asthma]), decreased lung functions (particularly in children and individuals with asthma), and alterations in lung tissue and structure and in respiratory tract defense mechanisms. The Basin is designated nonattainment for the federal and State PM_{10} standards. The Basin is designated as an "Unclassified" area for the federal and State $PM_{2.5}$ standards, with the exception of the County Portion of Federal Ozone Air Quality Maintenance Area, which is designated as Nonattainment under the State $PM_{2.5}$ standards.

Volatile Organic Compounds

Volatile organic compounds (VOCs; also known as ROGs, and reactive organic compounds [ROCs]) are formed from the combustion of fuels and the evaporation of organic solvents. VOCs are not defined as criteria pollutants, but are a prime component of the photochemical smog reaction. Consequently, VOCs accumulate in the atmosphere more quickly during the winter when sunlight is limited and photochemical reactions are slower. There are no attainment designations for VOCs.

Sulfates

Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features. The entire Basin is in attainment for the State standard for sulfates.

Hydrogen Sulfide

H_2S is a colorless gas with the odor of rotten eggs. H_2S is formed during bacterial decomposition of sulfur-containing organic substances. Also, H_2S can be present in sewer gas and some natural gas and can be emitted as the result of geothermal energy exploitation. In 1984, an ARB committee concluded that the ambient standard for H_2S is adequate to protect public health and to significantly reduce odor annoyance. The Basin is unclassified for the State standard of H_2S, with the exception of Searles Valley, which is designated as a nonattainment area.

Visibility-Reducing Particles

Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials (e.g., metals, soot, soil, dust, and salt). The statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. The entire Basin is unclassified for the State standard for visibility-reducing particles.

LOCAL AIR QUALITY

The MDAQMD collects O_3, CO, NO_2, SO_2, $PM_{2.5}$, and PM_{10} data measured at the Victorville Park Avenue monitoring station. This station is approximately 4 miles from the project area. Table E (Ambient Air Quality Monitored in the Project Vicinity) shows air pollution levels in the area.

The federal and State CO, NO_2, and SO_2 standards were not exceeded in the past 3 years.[1] The State 1-hour O_3 standard was exceeded three to nine times per year in the past 3 years. The federal 8-hour O_3 standard was exceeded 18 to 31 days per year in the past 3 years, and the State 8-hour O_3 standard was exceeded 39 to 60 times per year in the past 3 years. With the exception of a single measured occurrence in 2015, the federal 24-hour $PM_{2.5}$ standards were not exceeded in the past 3 years. The federal annual average $PM_{2.5}$ standards were not exceeded in the past 3 years. The State and federal annual average $PM_{2.5}$ standards were not exceeded in the past 3 years. The State 24-hour PM_{10} standards were exceeded every year in the past 3 years. With the exception of a single measured occurrence in 2014, the federal 24-hour PM_{10} standards were not exceeded in the past 3 years. The State annual average PM_{10} standards were exceeded every year at the Victorville Park Avenue monitoring station in the past 3 years.

Table E: Ambient Air Quality Monitored in the Project Vicinity

Pollutant	Standard	2013	2014	2015
Carbon Monoxide (CO) – 1-hour and 8-hour CO levels taken from the EPA Website for Victorville Park Avenue Station				
Maximum 1-hour concentration (ppm)		1.2	3.9	17.5
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		0.9	1.1	5.1
Number of days exceeded:	State: ≥ 9.0 ppm	0	0	0
	Federal: ≥ 9.0 ppm	0	0	0

[1] SO_2 data were not available for the project vicinity for the years 2014 and 2015.

Table E: Ambient Air Quality Monitored in the Project Vicinity

Pollutant	Standard	2013	2014	2015
Ozone (O_3) – taken from the Victorville Park Avenue Station				
Maximum 1-hour concentration (ppm)		0.120	0.122	0.132
Number of days exceeded:	State: > 0.09 ppm	9	3	8
Maximum 8-hour concentration (ppm)		0.097	0.097	0.106
Number of days exceeded:	State: > 0.07 ppm	60	40	39
	Federal: > 0.07 ppm	31[1]	18	21
Coarse Particulates (PM_{10}) – taken from the Victorville Park Avenue Station				
Maximum 24-hour concentration (µg/m^3)		77.9	246.2	100.8
Number of days exceeded:	State: > 50 µg/m^3	2	ND	ND
	Federal: > 150 µg/m^3	0	1	0
Annual arithmetic average concentration (µg/m^3)		22.5	30.2	24.9
Exceeded for the year:	State: > 20 µg/m^3	Yes	Yes	Yes
Fine Particulates ($PM_{2.5}$) – taken from the Victorville Park Avenue Station				
Maximum 24-hour concentration (µg/m^3)		13.8	24.1	50.2
Number of days exceeded:	Federal: > 35 µg/m^3	0	0	1
Annual arithmetic average concentration (µg/m^3)		ND	ND	6.6
Exceeded for the year:	State: > 12 µg/m^3	ND	ND	No
	Federal: > 15 µg/m^3	ND	ND	No
Nitrogen Dioxide (NO_2) – taken from the Victorville Park Avenue Station				
Maximum 1-hour concentration (ppm)		0.064	0.066	0.118
Number of days exceeded:	State: > 0.18 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.014	0.013	0.01
Exceeded for the year:	State: > 0.030 ppm	No	No	No
	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2) – taken from the Victorville Park Avenue Station				
Maximum 24-hour concentration (ppm)		0.002	ND	ND
Number of days exceeded:	State: > 0.04 ppm	ND	ND	ND
	Federal: > 0.14 ppm	ND	ND	ND
Annual arithmetic average concentration (ppm)		ND	ND	ND
Exceeded for the year:	Federal: > 0.030 ppm	ND	ND	ND

Sources: United States Environmental Protection Agency, website: www.epa.gov/air/data/index.html; and California Air Resources Board, iADAM: Air Quality Data Statistics, website: www.arb.ca.gov/adam/welcome.html, both accessed September 2017.

[1] The exceedances of the federal 8-hour O_3 standard are based on the old 0.75 ppm standard. In October 1 2015, the EPA revised the standard to 0.070 ppm.

µg/m^3 = micrograms per cubic meter
ND = no data available
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
EPA = United States Environmental Protection Agency
PM_{10} = particulate matter less than 10 microns in size
ppm = parts per million

REGULATORY SETTINGS

Federal Regulations/Standards

Pursuant to the Federal Clean Air Act of 1970 (CAA), the EPA established the NAAQS. The NAAQS were established for six major pollutants that are termed to be "criteria" pollutants. Criteria

pollutants are defined as those pollutants for which the federal and state governments have established AAQS, or criteria, for outdoor concentrations in order to protect public health.

The EPA uses data collected at permanent monitoring stations to classify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA. The EPA has designated the Southern California Association of Governments (SCAG) as the Metropolitan Planning Organization (MPO) responsible for ensuring compliance with the requirements of the CAA for the Basin.

In an effort to help federal agencies ensure the integrity of their environmental reviews and promote sound governmental decision making, the Council on Environmental Quality (CEQ) on January 14, 2011, issued final guidance on the "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact." This guidance was developed as part of the CEQ's effort to modernize and reinvigorate federal agency implementation of the National Environmental Policy Act.

The EPA established new national air quality standards for ground-level O_3 and $PM_{2.5}$ in 1997. On May 14, 1999, the Court of Appeals for the District of Columbia Circuit issued a decision ruling that the CAA, as applied in setting the new public health standards for O_3 and particulate matter, was unconstitutional as an improper delegation of legislative authority to the EPA. On February 27, 2001, the United States Supreme Court upheld the way the government sets air quality standards under the CAA. The court unanimously rejected industry arguments that the EPA must consider financial cost as well as health benefits in writing standards. The justices also rejected arguments that the EPA took too much lawmaking power from Congress when it set tougher standards for O_3 and soot in 1997. Nevertheless, the court threw out the EPA's policy for implementing new O_3 rules, saying that the agency ignored a section of the law that restricts its authority to enforce such rules.

In April 2003, the EPA was cleared by the White House Office of Management and Budget to implement the 8-hour ground-level O_3 standard. The EPA issued the proposed rule implementing the 8-hour O_3 standard in April 2003. The EPA completed final 8-hour nonattainment status on April 15, 2004. The EPA revoked the 1-hour O_3 standard on June 15, 2005, and lowered the 8-hour O_3 standard from 0.08 parts per million (ppm) to 0.075 ppm on April 1, 2008.

The EPA issued the final $PM_{2.5}$ implementation rule in fall 2004. The EPA lowered the 24-hour $PM_{2.5}$ standard from 65 to 35 micrograms per cubic meter ($\mu g/m^3$) and revoked the annual PM_{10} standard on December 17, 2006. The EPA issued final designations for the 2006 24-hour $PM_{2.5}$ standard on December 12, 2008.

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the EPA has the authority to regulate CO_2 emissions under the CAA. While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the EPA commenced several actions in 2009 that are required to implement a regulatory approach to GCC.

On September 30, 2009, the EPA announced a proposal that focuses on large facilities emitting over 25,000 tons of GHG emissions per year. These facilities would be required to obtain permits that would demonstrate they are using the best practices and technologies to minimize GHG emissions.

On December 7, 2009, the EPA Administrator signed a final action under the CAA, finding that six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to GCC. This EPA action does not impose any requirements on industry or other entities. However, the findings are a prerequisite to finalizing the GHG emission standards for light-duty vehicles mentioned below.

On April 1, 2010, the National Highway Traffic Safety Administration (NHTSA) and the EPA issued a joint final rule establishing a new national program to regulate passenger cars and light trucks to improve fuel economy and reduce GHG emissions. According to the latest update, issued on July 18, 2016, the NHTSA, the EPA, and the ARB increased Corporate Average Fuel Economy (CAFE) standards for passenger cars and light trucks from an average fuel economy of 34.1 miles per gallon by model year 2016 to 38.3 miles per gallon by model year 2021 and 46.3 miles per gallon by model year 2025. Together with the EPA's standards for GHG emissions, which also enable manufacturers to achieve compliance by improving the air conditioners of their vehicles, the national program overall is expected to result in improvement levels equivalent to 50.8 miles per gallon.

State Regulations/Standards

In 1967, the State Legislature passed the Mulford-Carrell Act, which combined two Department of Health bureaus, the Bureau of Air Sanitation and the Motor Vehicle Pollution Control Board, to establish the ARB. Since its formation, the ARB has worked with the public, the business sector, and local governments to find solutions to the State's air pollution problems.

California adopted the CCAA in 1988. The ARB administers CAAQS for the 10 air pollutants designated in the CCAA. The 10 State air pollutants are the six criteria pollutants designated by the CAA plus visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The ARB identified diesel particulate matter (DPM) from diesel-fueled engines as a toxic air contaminant (TAC) in August 1998. Following the identification process, the ARB was required by law to determine whether there was a need for further control. In September 2000, the ARB adopted the Diesel Risk Reduction Plan, which recommends many control measures to reduce the risks associated with DPM and to achieve goals of 75 percent DPM reduction by 2010 and 85 percent by 2020.

The public's exposure to TACs is a significant environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. Under State law, the CalEPA, acting through the ARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or that may pose a present or potential hazard to human health.

- **Cancer Risk:** One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern

because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens; that is, any exposure to a carcinogen poses some risk of causing cancer. Health statistics show that 1 in 4 people will contract cancer over their lifetime, or 250,000 in 1 million, from all causes, including diet, genetic factors, and lifestyle choices.

- **Non-Cancer Health Risks:** Unlike carcinogens, it is believed there is a threshold level of exposure to most noncarcinogens below which they will not pose a health risk. The CalEPA and the Office of Environmental Health Hazard Assessment have developed reference exposure levels (RELs) for noncarcinogenic TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index.

California Climate Action Milestones

In 1988, AB 4420 directed the California Energy Commission (CEC) to report on "how global warming trends may affect California's energy supply and demand, economy, environment, agriculture, and water supplies" and offer "recommendations for avoiding, reducing and addressing the impacts." This marked the first statutory direction to a California State agency to address climate change.

The California Climate Action Registry was created to encourage voluntary reporting and early reductions of GHG emissions with the adoption of Senate Bill (SB) 1771 in 2000. The CEC was directed to assist by developing metrics and identifying and qualifying third-party organizations to provide technical assistance and advice to GHG emission reporters. The next year, SB 527 amended SB 1771 to emphasize third-party verification.

SB 1711 also contained several additional requirements for the CEC, including updating the State's GHG Emissions Inventory from an existing 1998 report and continuing to update it every 5 years; acquiring, developing, and distributing information on GCC to agencies and businesses; establishing a State interagency task force to ensure policy coordination; and establishing a climate change advisory committee to make recommendations on the most equitable and efficient ways to implement climate change requirements. In 2006, AB 1803 transferred preparation of the inventory from the CEC to the ARB by AB 1803. The ARB updates the inventory annually.

AB 1493, authored by Assembly Member Fran Pavley in 2002, directed the ARB to adopt regulations to achieve the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles. The so-called "Pavley" regulations, or Clean Car regulations, were approved by the ARB in 2004. The ARB submitted a request to the EPA to implement the regulations in December 2005. After several years of requests to the federal government and accompanying litigation, this waiver request was granted on June 30, 2009. The ARB has since combined the control of smog-causing pollutants and GHG emissions to develop a single coordinated package of standards known as Low Emission Vehicles III. These regulations are expected to reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016, all while improving fuel efficiency and reducing motorists' costs. AB 1493 also directed the California Climate Action Registry to adopt protocols for reporting reductions in greenhouse emissions from mobile sources prior to the operative date of the regulations.

SB 812 added forest management practices to the California Climate Action Registry members' reportable emissions actions. SB 812 also directed the California Climate Action Registry to adopt forestry procedures and protocols to monitor, estimate, calculate, report, and certify carbon stores and CO_2 emissions that resulted from the conservation and conservation-based management of forests in California.

The California Renewable Portfolio Standard Program, which requires electric utilities and other entities under the jurisdiction of the California Public Utilities Commission to meet 20 percent of their retail sales with renewable power by 2017, was established by SB 1078 in 2002. The renewable portfolio standard was accelerated to 20 percent by 2010 by SB 107 in 2006. The program was subsequently expanded by the renewable electricity standard approved by the ARB in September 2010, requiring all utilities to meet a 33 percent target by 2020. Issued on October 7, 2015, SB 350 increased the renewable energy target to 50 percent by 2030.

In December 2004, Governor Arnold Schwarzenegger signed Executive Order (EO) S-20-04, which set a goal of reducing energy use in State-owned buildings by 20 percent by 2015 (from a 2003 baseline) and encouraged cities, counties, schools, and the private sector to take all cost-effective measures to reduce building electricity use. This action built upon the State's strong history of energy efficiency efforts that have saved Californians and California businesses energy and money for decades. They are a cornerstone of GHG reduction efforts.

EO S-3-05 (June 2005) established GHG targets for the State such as returning to year 2000 emission levels by 2010; 1990 levels by 2020; and 80 percent below 1990 levels by 2050. EO S-3-05 directed the Secretary of the CalEPA to coordinate efforts to meet the targets with the heads of other State agencies. This group became the Climate Action Team (CAT).

In 2006, the State Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multiyear program to reduce GHG emissions in California. AB 32 required the ARB to develop a Scoping Plan that describes the approach California will take to reduce GHGs to achieve the goal of reducing emissions to 1990 levels by 2020. The Scoping Plan was first approved by the ARB in 2008 and must be updated every 5 years. The First Update to the Climate Change Scoping Plan was approved by the ARB on May 22, 2014. In 2016, the State Legislature passed SB 32, which codifies a 2030 GHG emissions reduction target of 40 percent below 1990 levels. With SB 32, the State Legislature passed companion legislation AB 197, which provides additional direction for developing the Scoping Plan. The ARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target set by EO B-30-15 and codified by SB 32.

The governors of California, Arizona, New Mexico, Oregon, and Washington entered into a memorandum of understanding in February 2007, establishing the Western Climate Initiative. The governors agreed to set a regional goal for emissions reductions consistent with state-by-state goals, develop a design for a regional market-based multi-sector mechanism to achieve the goal, and participate in a multistate GHG registry. The initiative has since grown to include Montana, Utah, and the Canadian provinces of British Columbia, Manitoba, Ontario, and Québec.

California is implementing the world's first Low Carbon Fuel Standard for transportation fuels, pursuant to both EO S-01-07, signed January 2007, and AB 32. The standard requires a reduction of

at least 10 percent in the carbon intensity of California's transportation fuels by 2020. This reduction is expected to reduce GHG emissions in 2020 by 17.6 MMT CO_2e. Also in 2007, AB 118 created the Alternative and Renewable Fuel and Vehicle Technology Program. The CEC and the ARB administer the program. This act provides funding for alternative fuel and vehicle technology research, development, and deployment in order to attain the State's climate change goals, achieve the State's petroleum reduction objectives and clean air and GHG emission reduction standards, develop public-private partnerships, and ensure a secure and reliable fuel supply.

In addition to vehicle emissions regulations and the low carbon fuel standard, the third effort reducing GHG emissions from transportation is the reduction in the demand for personal vehicle travel (i.e., vehicle miles traveled). This measure was addressed in September 2008 through the Sustainable Communities and Climate Protection Act of 2008 (SB 375). The enactment of SB 375 initiated an important new regional land use planning process to mitigate GHG emissions by integrating and aligning planning for housing, land use, and transportation for California's 18 MPOs. The bill directed the ARB to set regional GHG emission reduction targets for most areas of the State. The bill also contained important elements related to federally mandated regional transportation plans and the alignment of State transportation and housing planning processes.

Also codified in 2008, SB 97 required the Governor's Office of Planning and Research to develop GHG emissions criteria to be used in determining project impacts under CEQA. These criteria were developed in 2009 and went into effect in 2010.

EO S-13-08 launched a major initiative for improving the State's adaptation to climate impacts from sea level rise, increased temperatures, shifting precipitation, and extreme weather events. EO S-13-08 ordered a California Sea Level Rise Assessment Report to be requested from the National Academy of Sciences. EO S-13-08 also ordered the development of a Climate Adaptation Strategy. The strategy, published in December 2009, assesses the State's vulnerability to climate change impacts and outlines possible solutions that can be implemented within and across State agencies to promote resiliency. The strategy focused on seven areas: public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure.

On April 29, 2015, Governor Edmund G. Brown, Jr. issued EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The EO aligned California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris in late 2015. The EO set a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050, and directs the ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of MMT CO_2e. The EO also requires the State's climate adaptation plan to be updated every 3 years and the State to continue its climate change research program, among other provisions. Passed by the California State legislature on August 24, 2016, SB 32 codifies EO B-30-15's year 2030 goal by requiring that statewide GHG emissions be reduced 40 percent below 1990 levels by the year 2030. On January 22, 2017, the ARB provided a Draft 2017 Scoping Plan Update that will implement this legislation. The ARB is expected to adopt the 2017 Scoping Plan Update during the summer of 2017.

The initiatives, EOs, and statutes outlined above comprise the major milestones in California's efforts to address climate change through coordinated action on climate research, GHG mitigation, and climate change adaptation. Numerous other related efforts have been undertaken by State agencies and departments to address specific questions and programmatic needs. The CAT coordinates these efforts and others which comprise the State's climate program. The rest of the report describes these efforts.

Regional Air Quality Planning Framework

The 1976 Lewis Air Quality Management Act established the MDAQMD and other air districts throughout the State. The CAA Amendments of 1977 required each state to adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the state.

The ARB is responsible for incorporating air quality management plans for local air basins into an SIP for EPA approval. Significant authority for air quality control within them has been given to local air districts that regulate stationary-source emissions and develop local nonattainment plans.

Regional Air Quality Management Plan

The MDAQMD is responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the Basin. The main purpose of an AQMP is to bring the area into compliance with federal and State air quality standards. The MDAQMD adopted the 2009 AQMP on January 25, 2010. The 2009 AQMP includes the latest planning assumptions regarding population, vehicle activity and industrial activity, and addresses all existing and forecast ozone precursor-producing activities within the MDAQMD through the year 2020.

Local Regulations and Standards

Greenhouse Gas Reduction Plan

In 2014, the City participated in the San Bernardino Associated Governments (SANBAG) Regional GHG Reduction Plan. The City selected a goal to reduce its community GHG emissions to a level that is 15 percent below its 2008 GHG emissions level by 2020, or 29 percent below 2020 levels at business-as-usual (BAU) growth and development. The City also adopted GHG Emissions Screening Tables to provide guidance in measuring the reduction of GHG emissions attributable to certain design and construction measures incorporated into development projects.

THRESHOLDS OF SIGNIFICANCE

A number of modeling tools are available to assess air quality impacts of projects. In addition, certain air districts (e.g., MDAQMD) have created guidelines and requirements to conduct air quality analysis. The MDAQMD's current guidelines, the *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* (2016), were followed in the assessment of air quality impacts for the proposed project. The current air quality model, California Emissions Estimator Model (CalEEMod) Version 2016.3.1, was used to estimate project-related mobile- and stationary-source emissions in this air quality and GHG impact analysis.

This air quality and GHG impact analysis includes estimated emissions associated with short-term construction and long-term operation of the proposed project. Criteria pollutants with regional impacts would be emitted by project-related vehicular trips as well as by emissions associated with stationary sources used on site. Localized air quality impacts (i.e., higher CO concentrations [CO hotspots] near intersections or roadway segments in the project vicinity) would be small and less than significant due to the generally low ambient CO concentrations (maximum 17.5 ppm for the 1-hour period and 5.1 ppm for the 8-hour period) in the project area.

The net increase in pollutant emissions determines the significance and impact on regional air quality as a result of the proposed project. The results also allow the local government to determine whether the proposed project will deter the region from achieving the goal of reducing pollutants in accordance with the AQMP in order to comply with NAAQS and CAAQS.

Based on Appendix G, Public Resource Code Sections 15000–15387 of the State *CEQA Guidelines*, a project would normally be considered to have a significant effect on air quality if the project would violate any AAQS, contribute substantially to an existing air quality violation, expose sensitive receptors to substantial pollutants concentrations, or conflict with adopted environmental plans and goals of the community in which it is located.

REGIONAL THRESHOLDS OF SIGNIFICANCE

In addition to the NAAQS and CAAQS, the MDAQMD has established daily and annual emissions thresholds for the operation of a proposed project in the Basin. The emissions thresholds were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emissions thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

The CEQA significance thresholds for operational emissions have been established for the Basin and are presented in Table F. Projects in the Basin with operational emissions that exceed any of these emission thresholds are considered to be significant under the MDAQMD guidelines. The proposed project would not result in the emission of H_2S or lead, so the thresholds of these two pollutants are not further considered in the project impacts analyses.

Table F: Mojave Desert Air Quality Management District Significant Emissions Thresholds

Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
Greenhouse Gases (CO_2e)	100,000	548,000
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NOx)	25	137
Volatile Organic Compounds (VOC)	25	137
Oxides of Sulfur (SOx)	25	137
Particulate Matter (PM_{10})	15	82
Particulate Matter ($PM_{2.5}$)	12	65
Hydrogen Sulfide (H_2S)	10	54
Lead (Pb)	0.6	3

Source: Mojave Desert Air Quality Management District. *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* (August 2016).

THRESHOLDS FOR GLOBAL CLIMATE CHANGE

State *CEQA Guidelines* Section 15064(b) provides that the "determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data," and further states that an "ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting."

Appendix G of the State *CEQA Guidelines* includes the following questions related to GHG emissions that are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance:

- Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

However, despite this, neither the CEQA statutes nor any applicable guidelines currently prescribe thresholds of significance or a particular methodology for performing an impact analysis. As with most environmental topics, significance criteria are left to the judgment and discretion of the lead agency.

The MDAQMD has adopted a significance threshold of 100,000 MT per year of CO_2e (MT CO_2e/yr) for GHG emissions for new development projects. In addition, the City has adopted a GHG Emissions Screening Table for new development projects. A project must reach a minimum of 45 points by incorporating reduction measures into the development.

This report will use both the MDAQMD's threshold of 100,000 MT CO_2e/yr and the City's GHG Emissions Screening Table (a minimum of 45 points) to determine project significance.

IMPACTS AND MITIGATION

Air pollutant emissions associated with the project would occur over the short term from construction activities (e.g., fugitive dust from site preparation and grading) and emissions from equipment exhaust. There would be long-term regional emissions associated with project-related vehicular trips and energy consumption (e.g., electricity usage) by the proposed land uses.

CONSTRUCTION IMPACTS

Equipment Exhaust and Related Construction Activities

Construction activities produce combustion emissions from various sources (e.g., site preparation, utility engines, and motor vehicles transporting the construction crew). Exhaust emissions from construction activities envisioned on site would vary daily as construction activity levels change. The use of construction equipment on site would result in localized exhaust emissions.

The details of the project construction were not available yet, so the inputs were derived from CalEEMod defaults and similar projects. Table G lists the potential construction schedule.

Table G: Estimated Construction Schedule

Phase No.	Phase Name	Phase Start Date	Phase End Date	No. of Days/Week	No. of Days
1	Site Preparation	7/2/2018	7/13/2018	5	10
2	Building Construction	7/14/2018	5/31/2019	5	230
3	Paving	6/1/2019	6/28/2019	5	20
4	Architectural Coating	6/29/2019	7/26/2019	5	20

Source: Compiled by LSA (September 2017).

The details of what construction equipment would be used in the construction of the project have not been finalized as of the time of this air quality and GHG impact analysis. Table H lists a standard set of construction equipment capable of completing the anticipated project construction. This set was developed using the most recent version of CalEEMod (Version 2016.3.1) and specifying the site area and planned land use.

CalEEMod was used to calculate the construction emissions, as shown in Table I (based on equipment listed above). The emissions rates shown are the combination of the onsite and offsite emissions.

The emissions shown in Table I are all below the significance thresholds; the actual construction emissions would also be below these thresholds. Because no exceedances of any criteria pollutants are expected, no significant impacts would occur for project construction. Standard measures are discussed later in this report. The details of the emission factors and other assumptions are included in Appendix A.

Table H: Diesel Construction Equipment Utilized by Construction Phase

Construction Phase	Off-Road Equipment Type	Off-Road Equipment Unit Amount	Hours Used per Day	HP	Load Factor
Site Preparation	Rubber-Tired Dozers	3	8	247	0.40
	Tractors/Loaders/Backhoes	4	8	97	0.37
Building Construction	Cranes	1	7	231	0.29
	Forklifts	3	8	89	0.20
	Generator Sets	1	8	84	0.74
	Tractors/Loaders/Backhoes	3	7	97	0.37
	Welders	1	8	46	0.45
Paving	Pavers	2	8	130	0.42
	Paving Equipment	2	8	132	0.36
	Rollers	2	8	80	0.38
Architectural Coating	Air Compressors	1	6	78	0.48

Source: Compiled by LSA (September 2017).

HP = horsepower

Table I: Regional Construction Emissions

	Total Regional Pollutant Emissions, lbs/day								
					PM_{10}		$PM_{2.5}$		
Construction Phase	VOC	NOx	CO	SOx	Fugitive	Exhaust	Fugitive	Exhaust	CO_2e
Site Preparation	4.7	48	23	0.04	18	2.6	10.0	2.4	3,861.44
Building Construction	2.8	24	19	0.03	0.24	1.5	0.06	1.4	2,636.99
Paving	1.5	15	15	0.02	0.12	0.83	0.03	0.76	2,274.85
Architectural Coating	36	1.9	2.0	0.00	0.04	0.13	0.01	0.13	282.04
Peak Daily	**36**	**48**	**23**	**0.04**	**21**		**12**		**3,861.44**
MDAQMD Thresholds	**137**	**137**	**548**	**137**	**82**		**65**		**548,000**
Significant Emissions?	**No**	**No**	**No**	**No**	**No**		**No**		**No**

Source: Compiled by LSA (September 2017).

CO = carbon monoxide
CO_2e = carbon dioxide equivalent
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
MDAQMD = Mojave Desert Air Quality Management District
SOx = sulfur oxides
VOC = volatile organic compounds

Fugitive Dust

Fugitive dust emissions are generally associated with land clearing and exposure of soils to the air and wind, as well as cut-and-fill grading operations. Dust generated during construction varies substantially on a project-by-project basis depending on the level of activity, the specific operations, and weather conditions at the time of construction.

The proposed project will be required to comply with MDAQMD Rules 402 and 403 to control nuisance emissions and fugitive dust. CalEEMod does not provide for including these required

measures in any way other than as mitigation. However, these measures are not mitigating a significant air quality impact but are complying with the requirements. Thus, the PM_{10} and $PM_{2.5}$ emissions shown are from the CalEEMod output tables listed as "Mitigated Construction," even though the only measures that have been applied to the analysis are the required construction emissions control measures, or standard conditions.

Odors

Heavy-duty equipment in the project area during construction would emit odors, primarily from the equipment exhaust. However, the construction activity would cease to occur after individual construction is completed. No other sources of objectionable odors have been identified for the proposed project and no mitigation measures are required.

MDAQMD Rule 402 regarding nuisances states: "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." The proposed uses are not anticipated to emit any objectionable odors. Therefore, objectionable odors posing a health risk to potential onsite and existing offsite uses would not occur as a result of the proposed project.

Naturally Occurring Asbestos

Asbestos is the name given to a group of fibrous minerals that occur naturally in rock formations in the environment. Naturally occurring asbestos (NOA) is the term applied to a natural geologic occurrence of various types of asbestos. NOA has been found to be present in the majority of counties in California. NOA is commonly found in ultramafic rock formations, including serpentine, and in the soils where these rock types are located. NOA may pose a health risk if asbestos-containing rocks are crushed or broken and asbestos fibers are released into the air, though these health risks are not yet fully understood.

The proposed project is located in San Bernardino County, which is among the counties that are found to have ultramafic rock in their soils.[1] However, according to the California Geological Survey, no such rock has been identified in the vicinity of the project site. By following standard nuisance and dust control measures as required by MDAQMD Rules 402 and 403, any NOA that might be disturbed would not become airborne. Therefore, the potential risk for NOA exposure to nearby residents during project construction is small and less than significant.

Construction Emissions Conclusions

As established in Table I, daily regional construction emissions would not exceed the daily thresholds of any criteria pollutant emission thresholds established by the MDAQMD.

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1 California Department of Conservation, California Geological Survey. Asbestos. Website: http://www.conservation.ca.gov/cgs/minerals/hazardous_minerals/asbestos/Pages/index.aspx (accessed September 2017).

REGIONAL AIR QUALITY IMPACTS

Methodology

The project area operational (vehicular) impacts are dependent on the overall daily vehicle trip generation. The project area related operational air quality impacts derive primarily from vehicle trips generated by the project. Trip characteristics were taken from CalEEMod defaults for single-family homes in MDAQMD and are provided in Appendix A.

For the purposes of the air quality study, the actual number of vehicles, by vehicle classification (e.g., passenger cars, light trucks, and heavy trucks), was used in the analysis to accurately estimate vehicular-source emissions in the model.

Vehicles traveling on paved roads would be a source of fugitive emissions due to the generation of road dust inclusive of tire wear particulates. The emissions estimates for travel on paved roads were calculated using CalEEMod.

Based on the undeveloped nature of the project site, there are no existing operational emissions associated with the project area.

Project Operational Emissions

Operational air pollutant emission impacts are those associated with stationary sources and mobile sources involving any project-related changes. The proposed project would result in area-, energy-, and mobile-source emissions. Area sources include architectural coatings, consumer products, hearths, and landscaping. Energy sources include electricity and natural gas consumption. Trip generation rate was taken from CalEEMod defaults for single-family homes in MDAQMD. Tables J and K show daily and annual operational emissions associated with the proposed project.

Table J: Regional Daily Operational Emissions

Source	Pollutant Emissions (lbs/day)					
	VOCs	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Area Sources	101.56	1.97	126.21	0.22	16.98	16.98
Energy Sources	0.07	0.60	0.26	<0.01	0.05	0.05
Mobile Sources	1.90	13.09	19.25	0.07	3.90	1.08
Total Emissions	**103.53**	**15.66**	**145.71**	**0.29**	**20.93**	**18.11**
MDAQMD Thresholds	**137**	**137**	**548**	**137**	**82**	**65**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (September 2017).

CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
MDAQMD = Mojave Desert Air Quality Management District
SOx = sulfur oxides
VOCs = volatile organic compounds

Table K: Regional Annual Operational Emissions

Source	Pollutant Emissions (tons/year)					
	VOCs	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Area Sources	4.66	0.084	5.43	<0.01	0.70	0.70
Energy Sources	0.013	0.11	0.047	<0.01	<0.01	<0.01
Mobile Sources	0.27	2.31	3.05	0.011	0.67	0.18
Total Emissions	**4.95**	**2.50**	**8.53**	**0.020**	**1.37**	**0.89**
MDAQMD Thresholds	**25**	**25**	**100**	**25**	**12**	**12**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (September 2017).

CO = carbon monoxide
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
VOCs = volatile organic compounds
PM_{10} = particulate matter less than 10 microns in size
MDAQMD = Mojave Desert Air Quality Management District
SOx = sulfur oxides

Tables J and K show that the peak daily and total annual emissions of the criteria pollutants as a result of the proposed project would not exceed the daily and annual emission thresholds established by the MDAQMD. Therefore, the impacts would be insignificant and no mitigation measures would be required.

Project Greenhouse Gas Emissions

This section evaluates potential significant impacts related to GCC that could result from implementation of the proposed project. Because it is not possible to tie specific GHG emissions to actual changes in climate, this evaluation focuses on the project's emission of GHGs. Mitigation measures are identified as appropriate.

Greenhouse Gas Emissions Background

Emissions estimates for the proposed project are discussed below. GHG emissions estimates are provided herein for informational purposes only, because there is no established quantified GHG emissions threshold. Bearing in mind that CEQA does not require "perfection" but instead "adequacy, completeness, and a good faith effort at full disclosure," the analysis below is based on methodologies and information available to the City and the applicant at the time this analysis was prepared. Estimation of GHG emissions in the future does not account for all changes in technology that may reduce such emissions; therefore, the estimates are based on past performance and represent a scenario that is worse than that which is likely to be encountered (after energy-efficient technologies have been implemented). While information is presented below to assist the public and decision-makers in understanding the project's potential contribution to GCC impacts, the information available to the cities is not sufficiently detailed to allow a direct comparison between particular project characteristics and particular climate change impacts, or between any particular proposed mitigation measure and any reduction in climate change impacts.

Overall, the following activities associated with the proposed project could directly or indirectly contribute to the generation of GHG emissions:

- **Gas, Electricity, and Water Use:** Natural gas use results in the emission of two GHGs: CH_4 (the major component of natural gas) and CO_2 (from the combustion of natural gas). Electricity use can result in GHG production if the electricity is generated by combusting fossil fuel. California's water conveyance system is energy-intensive. Preliminary estimates indicate that the total energy used to pump and treat this water exceeds 19 percent of the total electricity used in the State per year (CEC 2005).
- **Solid Waste Disposal:** Solid waste generated by the project could contribute to GHG emissions in a variety of ways. Landfilling and other methods of disposal use energy for transporting and managing the waste and they produce additional GHGs to varying degrees. Landfilling, the most common waste management practice, results in the release of CH_4 from the anaerobic decomposition of organic materials. CH_4 is 25 times more potent a GHG than CO_2. However, landfill CH_4 can also be a source of energy. In addition, many materials in landfills do not decompose fully, and the carbon that remains is sequestered in the landfill and not released into the atmosphere.
- **Motor Vehicle Use:** Transportation associated with the proposed project would result in GHG emissions from the combustion of fossil fuels in daily automobile and truck trips.

Project-related GHG emissions would occur over the long term, such as those associated with project-related new vehicular trips and stationary-source emissions (e.g., natural gas used for heating and electricity usage for lighting). The calculation presented below includes construction emissions in terms of CO_2, CH_4, N_2O, and annual CO_2e GHG emissions from increased energy consumption, water usage, solid waste disposal, and estimated GHG emissions from vehicular traffic that would result from implementation of the project.

Construction activities produce combustion emissions from various sources, including site grading, utility engines, onsite heavy-duty construction vehicles, equipment hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. Exhaust emissions from onsite construction activities would vary daily as construction activity levels change.

Table L lists annual GHG emissions for the construction scenario years (2018 and 2019) and shows that the GHG emissions would generate approximately 185 MT CO_2e during the entire construction period.

Table L: Construction Greenhouse Gas Emissions

Construction Period	Total Regional Pollutant Emissions (MT/yr)			
	CO_2	CH_4	N_2O	CO_2e
2018	184.05	0.04	0.00	185.11
2019	172.15	0.04	0.00	173.14
Total	**184.05**	**0.04**	**0.00**	**185.11**
MDAQMD Threshold				**100,000.00**
Significant?				**No**

Source: Compiled by LSA (September 2017).

CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
MDAQMD = Mojave Desert Air Quality Management District
MT/yr = metric tons per year
N_2O = nitrous oxide

Operation of the proposed project area would generate GHG emissions from area and mobile sources and indirect emissions from stationary sources associated with energy consumption. Mobile-source emissions of GHGs would include project-generated vehicle trips associated with proposed uses. Area-source emissions would be associated with activities including landscaping and maintenance of proposed land uses, natural gas for heating, and other sources. Increases in stationary-source emissions would also occur at offsite utility providers as a result of demand for electricity, natural gas, and water by the proposed uses.

The GHG emission estimates presented in Table M show the emissions associated with the level of development envisioned by the proposed project without project design features at buildout. Appendix A includes the worksheets for the GHG emissions.

Table M: Operational Greenhouse Gas Emissions

Source	Pollutant Emissions (MT/yr)					
	Bio-CO_2	**NBio-CO_2**	**Total CO_2**	**CH_4**	**N_2O**	**CO_2e**
Area Sources	66	29	95	0.06	<0.01	98
Energy Sources	0	318	318	0.01	<0.01	319
Mobile Sources	0	980	980	0.08	0	982
Waste Sources	15	0	15	0.90	0	38
Water Usage	1.3	27	28	0.14	<0.01	32
Total Emissions						**1,481**
MDAQMD Threshold						**100,000**
Significant?						**No**

Source: Compiled by LSA (September 2017).

Note: Numbers in table may not appear to add up correctly due to rounding of all numbers to two significant digits.

Bio-CO_2 = biologically generated carbon dioxide
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
MDAQMD = Mojave Desert Air Quality Management District
MT/yr = metric tons per year
N_2O = nitrous oxide
NBio-CO_2 = non-biologically generated carbon dioxide

As shown in Table M, the proposed project would not result in GHG emissions that exceed the MDAQMD threshold of 100,000 MT CO_2e/yr for new development. The project's compliance with GHG Emissions Screening Table with implementation of project design feature is further discussed below.

Greenhouse Gas Emissions Screening Table

As discussed in the Thresholds section, the City's CAP provides guidance and screening tables, which can be used by a new development project to demonstrate that the project would achieve its fair-share contribution toward meeting the reduction goals of the CAP. The following project design feature was included when evaluating the proposed project based on the City's CAP screening table for residential projects:

- **2016 Title 24:** The CAP screening tables were created in 2012; therefore, references to Title 24 are based on the 2008 standards. The proposed project will be built according to 2016 Title 24

Standards, which are approximately 28 percent more energy efficient than the 2013 standards and 66.4 percent more energy efficient than the 2008 standards for residential projects.

As shown in Table N, the project will achieve 92 points based on the project design feature and will achieve its fair-share contribution toward meeting the reduction goals of the City's CAP. Therefore, the project would not result in the generation of significant GHG emissions.

Table N: Victorville Residential GHG Emissions Screening Table – Project Points

Measure	Description	Assigned Point Value	Project Points
Reduction Measure PS E1: Residential Energy Efficiency			
Building Envelope			
Insulation	Modestly Enhanced Insulation	12	12
Windows	Modestly Enhanced Window Insulation	6	6
Cool Roof	Enhanced Cool Roof	14	14
Air Infiltration	Blower Door HERS Verified Envelope Leakage or equivalent	8	8
	Air barrier applied to exterior walls, calking, and visual inspection such as the HERS Verified Quality Insulation Installation (QII or equivalent)	10	
Thermal Storage of Building	Modest Thermal Mass	2	0
	Enhanced Thermal Mass	4	
Indoor Space Efficiencies			
Heating/Cooling Distribution System	Modest Duct Insulation	7	7
Space Heating/Cooling Equipment	Improved Efficiency HVAC	4	4
Water Heaters	Improved Efficiency Water Heater	12	12
Daylighting	All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.)	1	1
	All rooms daylighted	2	
Artificial Lighting	Efficiency Lights	8	8
Appliances	Energy Star Refrigerator	1	3
	Energy Star Dish Washer	1	
	Energy Star Washing Machine	1	
Miscellaneous Residential Building Efficiencies			
Building Placement	North/south alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting	5	0
Shading	At least 90% of south-facing glazing will be shaded by vegetation or overhangs at noon on June 21	4	0
Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the project	TBD	0
Other	This allows innovation to provide design features that increase the energy efficiency of the project not provided in the table	TBD	0

Table N: Victorville Residential GHG Emissions Screening Table – Project Points

Measure	Description	Assigned Point Value	Project Points
Existing Residential Building Retrofits	Energy efficiency retrofit projects to existing residential dwelling units to further the point value of the project	TBD	0
Reduction Measure PS E2: Residential Renewable Energy Generation			
Photovoltaic	Solar Ready Homes (sturdy roof and solar ready service panel)	2	2
	Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements (10-100% of power needs of the project)	10–58	
Wind Turbines	Individual wind turbines at homes or collective neighborhood arrangements (10–100% of power needs of the project)	10–58	0
Offsite Renewable Energy Project	Offsite renewable energy project such as renewable energy retrofits of existing homes	TBD	0
Other Renewable Energy Generation	Innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table	TBD	0
Reduction Measure R2 W1: Residential Water Conservation			
Irrigation and Landscaping			
Water Efficient Landscaping	Limit conventional turf to < 25% of required landscape area	4	4
Water Efficient Irrigation Systems	Low precipitation spray heads < .75”/hr or drip irrigation	2	2
Recycled Water	Recycled connections (purple pipe) to irrigation system onsite	6	0
Water Reuse	Gray water reuse system collects gray water from clothes washers, showers and faucets for irrigation use	12	0
Storm Water Reuse Systems	Innovative onsite storm water collection, filtration, and reuse systems that provide supplemental irrigation water	TBD	0
Potable Water			
Showers	Water Efficient Showerheads	3	3
Toilets	Water Efficient Toilets	3	3
Faucets	Water Efficient Faucets	3	3
Dishwasher	Water Efficient Dishwashers	1	0
Washing Machine	Water Efficient Washing Machine	1	0
WaterSense	EPA WaterSense Certification	12	0
Reduction Measure PS T1: Land Use Based Trips and VMT Reduction			
Mixed Use	Point value of mixed-use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT	TBD	0
Residential Near Local Retail (Residential only Projects)	Having residential developments within walking and biking distance of local retail	TBD	0
Other Trip Reduction Measures	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project	TBD	0

Table N: Victorville Residential GHG Emissions Screening Table – Project Points

Measure	Description	Assigned Point Value	Project Points
Reduction Measure PS T2: Bicycle Infrastructure			
Bicycle Infrastructure	Provide bicycle paths within project boundaries	TBD	0
	Provide bicycle path linkages between project site and other land uses	2	
	Provide bicycle path linkages between project site and transit	5	
Reduction Measure PS T3: Neighborhood Electric Vehicle Infrastructure			
Electric Vehicle Recharging	Provide circuit and capacity in garages of residential units for use by an electric vehicle. Charging stations are for on-road electric vehicles legally able to drive on all roadways including Interstate Highways and freeways.	1	0
	Install electric vehicle charging stations in the garages of residential units	8	
		Total Points Achieved by Project	**92**
		Victorville CAP Screening Table Points Goal	**45**
		Points Goal Achieved?	**Yes**
		Significant Impact?	**No**

Source: City of Victorville. Greenhouse Gas Emissions Screening Table Review. Website: http://www.victorvilleca.gov/uploadedFiles/CityDepartments/Development/GHG%20Screening%20Table%20Development%20Dept%20%20Form%20_2_.pdf, accessed September 2017

Note: Screening Tables were created based on 2008 Title 24 Standards. The proposed project will be built according to 2016 Title 24 Standards, which are approximately 66.4 percent more energy efficient than the 2008 standards.

HVAC = heating, ventilation, air conditioning
CAP = climate action plan
EPA = Environmental Protection Agency
LED = light emitting diode
TBD = to be determined
VMT = vehicle miles traveled

MICROSCALE (CARBON MONOXIDE HOTSPOT) ANALYSIS

As discussed below, the project would not result in potentially adverse CO concentrations or "hotspots." Further, detailed modeling of project-specific CO hotspots is not needed to reach this conclusion.

The Basin is designated attainment under the CAAQS and NAAQS for CO. A CO hotspot would occur if an exceedance of the State 1-hour standard of 20 ppm or the 8-hour standard of 9 ppm were to occur. It has long been recognized that adverse localized CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. In response, vehicle emissions standards have become increasingly stringent in the last 20 years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams per mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentrations in the Basin have steadily declined.

The project would be adjacent to State Highway 395 and State Route 18. As shown in *2015 Traffic Volumes on California State Highways* (Caltrans 2015), average daily trips (ADT) is 21,500 on State

Highway 395 and 8,400 ADTs on State Route 18. As shown in CalEEMod output in Appendix A, the project would generate 609 average daily trips on weekdays, which is nominal compared to traffic on State Highway 395 and State Route 18. Therefore, the project would not contribute much traffic to the adjacent roadways and would not cause an impact to intersection operations.

Therefore, the project can be implemented in an existing setting with no significant peak-hour intersection impacts. Given the extremely low level of CO concentrations in the project area and no project-traffic related impacts at any intersections, project-related vehicle emissions are not expected to result in the CO concentrations exceeding the State or federal CO standards.

EXPOSURE TO TOXIC AIR CONTAMINANTS

Construction Activity

Construction activities would include operation of diesel-fueled off-road equipment, resulting in emissions of DPM, a recognized TAC. However, because carcinogenic DPM health risk is estimated using the annual average concentration over long exposure periods (9 to 70 years), estimating carcinogenic health risk for exposure periods less than 9 years is not typical. Construction activity associated with the project would occur over an estimated duration of 9 months and would be less than the 9-year exposure period that would necessitate further evaluation. The most conservative distance to evaluate exposure to sensitive receptors is 25 meters (80 feet). The closest receptors to the proposed project construction area would be 213 meters (700 feet). As discussed above, emissions generated during construction of proposed project would not exceed the thresholds and, therefore, would not substantially affect nearby receptors. As such, the project's potential health risk impact associated with DPM during construction activity is less than significant.

Operational Activity

Operational activities associated with the project would be typical of other single-family homes. Since the proposed project is a residential development, no diesel-fueled truck trips would be associated with the project and no emissions of DPM would occur from project-generated vehicle trips. Therefore, no additional analysis is necessary and the project's potential health risk impact associated with DPM during operational activity would be less than significant.

ODORS

Potential odor sources associated with the proposed project may result from construction equipment exhaust, the application of asphalt and architectural coatings during construction activities, and the temporary storage of typical solid waste (refuse) associated with the proposed project's (long-term operational) uses. Standard construction requirements would minimize odor impacts from construction. The construction odor emissions would be temporary, short-term, and intermittent in nature and would cease upon completion of the respective phase of construction and are, thus, considered less than significant. Project-generated refuse is expected to be stored in covered containers and removed at regular intervals in compliance with the City's solid waste regulations.

The proposed project would also be required to comply with MDAQMD Rule 402 to prevent occurrences of public nuisances. Therefore, odors associated with the proposed project construction and operations would be less than significant and no mitigation is required.

AIR QUALITY MANAGEMENT PLAN CONSISTENCY

A consistency determination plays an essential role in local agency project review by linking local planning and unique individual projects to the air quality plans. A consistency determination fulfills the CEQA goal of fully informing local agency decision-makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are addressed. Only new or amended General Plan elements, Specific Plans, and significantly unique projects need to undergo a consistency review due to the air quality plan strategy being based on projections from local General Plans.

Projects are considered consistent with, and would not conflict with or obstruct implementation of the AQMP if the growth in socioeconomic factors (e.g., population, employment) is consistent with the underlying regional plans used to develop the AQMP. The future emissions forecasts are primarily based on demographic and economic growth projections provided by SCAG. Thus, demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by SCAG for their 2016 Regional Transportation Plan were used to estimate future emissions in the Final 2016 AQMP (SCAQMD 2016).

Pursuant to the methodology provided in the 2016 MDAQMD *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines,* consistency with the Basin AQMP is affirmed when a project: (1) complies with all applicable MDAQMD rules and regulations, (2) complies with all proposed control measures, and (3) is consistent with the growth forecasts in the AQMP. Consistency review is presented as follows:

1. The project would result in short-term construction and long-term operational pollutant emissions that are all less than the CEQA significance emissions thresholds established by MDAQMD, as demonstrated above; therefore, the project would not result in an increase in the frequency or severity of any air quality standards violation and will not cause a new air quality standard violation.
2. The *CEQA Air Quality Handbook* indicates that consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and significant projects. Significant projects include airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and offshore drilling facilities; therefore, the proposed project is not defined as significant.

Based on the consistency analysis presented above, the proposed project would be consistent with the current regional AQMP.

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT CONSTRUCTION CONTROL MEASURES

The Project Applicant shall include these standard construction measures for construction plans and shall require the construction contractor to implement the following measures:

- **Dust Control:**
  - Water exposed surfaces and haul roads at least two times per day.
  - Take actions sufficient to prevent project-related trackout onto paved surfaces.
  - Cover loaded haul vehicles while operating on publicly maintained paved surfaces.
  - Stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days.
  - Cleanup project-related trackout or spills on publicly maintained paved surfaces within 24 hours.
  - Reduce non-essential earthmoving activity under High Wind conditions (winds exceeding 25 miles per hour [mph]).
  - Reduce speeds on unpaved roads to less than 15 mph.
- **VOC Control Measures:**
  - Do not use architectural coatings with a VOC content in excess of the limits specified in Rule 1113.

TITLE 24 STANDARDS

The proposed project is required to comply with Title 24 of the California Code of Regulations established by the CEC regarding energy conservation and green building standards. These measures will result in reduced emissions during the construction and operation phases of the proposed project.

CUMULATIVE IMPACTS

The MDAQMD recognizes there is typically insufficient information to evaluate the cumulative contributions of multiple projects quantitatively because each project applicant has no control over nearby projects. Related projects could contribute to an existing or projected air quality exceedance because portions of the Basin are currently nonattainment for ozone, PM_{10}, and $PM_{2.5}$. However, each project would be required to comply with the MDAQMD's standard construction measures. This analysis assumes that individual projects that do not generate operational or construction emissions that exceed the MDAQMD's recommended daily thresholds for project-specific impacts would also not cause a commutatively considerable increase in emissions for those pollutants for which the Basin is in nonattainment. Therefore, the individual project would not be considered to have a significant, adverse air quality impact. Alternatively, individual project-related construction and operational emissions that exceed MDAQMD thresholds for project-specific impacts would be considered cumulatively considerable. As previously noted, with project design features, the project will not exceed the applicable MDAQMD regional threshold for construction and operational-source

emissions. As such, the project will not result in a cumulatively significant impact for construction or operational activity.

Construction Impacts

The project-specific evaluation of emissions presented in the preceding analysis demonstrates that project construction-source air pollutant emissions will not result in exceedances of regional thresholds. Therefore, project construction-source emissions will be considered less than significant on a project-specific and cumulative basis.

Operational Impacts

Project operational-source emissions will not exceed applicable MDAQMD regional thresholds. Therefore, project operational-source emissions will be considered less than significant on a project-specific and cumulative basis.

REFERENCES

California Air Resources Board (ARB). 2016a. Ambient Air Quality Standards. Website: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed September 2017.

———. 2016b. California GHG Emission Inventory. California Greenhouse Gas Emissions for 2000 to 2014 – Trends of Emissions and Other Indicators. June 17. Website: https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf, accessed September 2017.

———. 2016c. Greenhouse Gas Inventory Data – 2016 Edition. Website: https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf, accessed September 2017.

———. 2014. First Update to the Climate Change Scoping Plan: Building on the Framework Pursuant to Assembly Bill 32, the California Global Warming Solutions Act of 2006. Website: https://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf, accessed September 2017.

———. Air Quality Standards and Area Designations. Reviewed May 5, 2016. Website: http://www.arb.ca.gov/desig/desig.htm, accessed September 2017.

———. ARB Fact Sheet: Air Pollution and Health. Reviewed December 2, 2009. Website: http://www.arb.ca.gov/research/health/fs/fs1/fs1.htm, accessed September 2017.

———. iADAM: Air Quality Data Statistics. Website: http://www.arb.ca.gov/adam/index.html, accessed September 2017.

California Department of Conservation, California Geological Survey. Asbestos. Website: http://www.conservation.ca.gov/cgs/minerals/hazardous_minerals/asbestos/Pages/index.aspx, accessed September 2017.

California Department of Resources Recycling and Recovery (CalRecycle). 2015. *2014 Generator-Based Characterization of Commercial Sector Disposal and Diversion in California.* September.

California Department of Transportation (Caltrans). 2015. *2015 Traffic Volumes on California State Highways.*

California Energy Commission (CEC). 2005. *California's Water-Energy Relationship*. Website: http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF, accessed September 2017.

California Environmental Protection Agency (CalEPA). 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March.

California Public Utilities Commission (CPUC). Policy and Planning Division. 2017. *Energy Impacts of Cannabis Cultivation Workshop Report and Staff Recommendations.* April.

Intergovernmental Panel on Climate Change (IPCC). 2013. *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the IPCC. Website: http://www.ipcc.ch/report/ar5/wg1/, accessed September 2017.

Mojave Desert Air Quality Management District (MDAQMD). 2016. *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines.* August.

———. 2009. Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area). December. Adopted January 25, 2010.

———. 1996. Rule 403.2. Fugitive Dust Control for the Mojave Desert Planning Area. July 22. http://www.mdaqmd.ca.gov/Modules/ShowDocument.aspx?documentid=306, accessed September 2017.

———. 1976a. Rule 402. Nuisance. May 7. Website: http://www.mdaqmd.ca.gov/Modules/ShowDocument.aspx?documentid=312, accessed September 2017.

———. 1976b. Rule 403. Fugitive Dust. May 7. Website: http://www.mdaqmd.ca.gov/Modules/ShowDocument.aspx?documentid=313, accessed September 2017.

San Bernardino Associated Governments (SANBAG). 2014. San Bernardino County Regional Greenhouse Gas Reduction Plan. March.

State of California, Climate Change Portal. 2013. "Preparing California for Extreme Heat: Guidance and Recommendations." October.

United Nations Framework Convention on Climate Change (UNFCCC). 2015. GHG data from UNFCC. Website: http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php, accessed September 2017.

United States Environmental Protection Agency (EPA). 2016a. AirData Monitor Values Report. Website: https://www.epa.gov/outdoor-air-quality-data/monitor-values-report, accessed September 2017.

———. 2016b. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2014. April. Website: https://www.epa.gov/sites/production/files/2017-04/documents/us-ghg-inventory-2016-main-text.pdf, accessed September 2017.

———. 2010. *Methane and Nitrous Oxide Emissions from Natural Sources*. April. Website: http://nepis.epa.gov/Exe/ZyPDF.cgi/P100717T.PDF?Dockey=P100717T.PDF, accessed September 2017.

APPENDIX A

CALEEMOD PRINTOUTS

Vitorville Residential - Mojave Desert AQMD Air District, Annual

Vitorville Residential

Mojave Desert AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	64.00	Dwelling Unit	10.00	115,200.00	183

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	30
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - project description: 10+/- acres

Construction Phase - Site is currently vacant, and no grading is proposed

Area Mitigation - Assume architectural coatings comply with MDAQMD Rule 1113

Energy Mitigation - Assume that the project would comply with the 2016 Title 24 standards at a minimum, which is estimated to be 28% more efficient than 2013 Title 24 Standards for single family homes

Water Mitigation -

Architectural Coating - Assume architectural coatings comply with MDAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	50

tblAreaMitigation	UseLowVOCPaintResidentialInteriorVa lue	250	50
tblConstructionPhase	PhaseEndDate	9/19/2017	7/26/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	5/31/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	6/28/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	7/13/2018
tblConstructionPhase	PhaseStartDate	9/20/2017	6/29/2019
tblConstructionPhase	PhaseStartDate	9/20/2017	7/14/2018
tblConstructionPhase	PhaseStartDate	9/20/2017	6/1/2019
tblConstructionPhase	PhaseStartDate	9/20/2017	7/2/2018
tblLandUse	LotAcreage	20.78	10.00
tblProjectCharacteristics	OperationalYear	2018	2019

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1943	1.7142	1.2488	2.0700e-003	0.1051	0.1041	0.2092	0.0536	0.0976	0.1512	0.0000	184.0504	184.0504	0.0422	0.0000	185.1062
2019	0.5145	1.3687	1.1624	1.9500e-003	0.0143	0.0802	0.0945	3.8500e-003	0.0753	0.0791	0.0000	172.1539	172.1539	0.0393	0.0000	173.1363
Maximum	**0.5145**	**1.7142**	**1.2488**	**2.0700e-003**	**0.1051**	**0.1041**	**0.2092**	**0.0536**	**0.0976**	**0.1512**	**0.0000**	**184.0504**	**184.0504**	**0.0422**	**0.0000**	**185.1062**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2018	0.1943	1.7142	1.2488	2.0700e-003	0.1051	0.1041	0.2092	0.0536	0.0976	0.1512	0.0000	184.0502	184.0502	0.0422	0.0000	185.1060
2019	0.5145	1.3687	1.1623	1.9500e-003	0.0143	0.0802	0.0945	3.8500e-003	0.0753	0.0791	0.0000	172.1537	172.1537	0.0393	0.0000	173.1361
Maximum	**0.5145**	**1.7142**	**1.2488**	**2.0700e-003**	**0.1051**	**0.1041**	**0.2092**	**0.0536**	**0.0976**	**0.1512**	**0.0000**	**184.0502**	**184.0502**	**0.0422**	**0.0000**	**185.1060**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	**6-20-2018**	**9-19-2018**	0.8868	0.8868
5	**9-20-2018**	**12-19-2018**	0.8827	0.8827
6	**12-20-2018**	**3-19-2019**	0.7974	0.7974
7	**3-20-2019**	**6-19-2019**	0.7519	0.7519
8	**6-20-2019**	**9-19-2019**	0.4360	0.4360
		Highest	0.8868	0.8868

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.6605	0.0840	5.4346	9.0100e-003		0.6976	0.6976		0.6976	0.6976	66.1093	28.5015	94.6108	0.0618	5.2000e-003	97.7047
Energy	0.0128	0.1095	0.0466	7.0000e-004		8.8500e-003	8.8500e-003		8.8500e-003	8.8500e-003	0.0000	317.8073	317.8073	0.0103	3.9600e-003	319.2442
Mobile	0.2728	2.3112	3.0472	0.0106	0.6568	9.0400e-003	0.6658	0.1761	8.5300e-003	0.1846	0.0000	979.8382	979.8382	0.0815	0.0000	981.8751
Waste						0.0000	0.0000		0.0000	0.0000	15.2304	0.0000	15.2304	0.9001	0.0000	37.7327
Water						0.0000	0.0000		0.0000	0.0000	1.3229	26.6055	27.9284	0.1370	3.4400e-003	32.3765

Total	**4.9461**	**2.5046**	**8.5284**	**0.0203**	**0.6568**	**0.7155**	**1.3723**	**0.1761**	**0.7150**	**0.8911**	**82.6626**	**1,352.7526**	**1,435.4152**	**1.1906**	**0.0126**	**1,468.9332**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.5163	0.0840	5.4346	9.0100e-003		0.6976	0.6976		0.6976	0.6976	66.1093	28.5015	94.6108	0.0618	5.2000e-003	97.7047
Energy	9.8100e-003	0.0838	0.0357	5.3000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	281.9167	281.9167	9.4900e-003	3.3600e-003	283.1548
Mobile	0.2728	2.3112	3.0472	0.0106	0.6568	9.0400e-003	0.6658	0.1761	8.5300e-003	0.1846	0.0000	979.8382	979.8382	0.0815	0.0000	981.8751
Waste						0.0000	0.0000		0.0000	0.0000	15.2304	0.0000	15.2304	0.9001	0.0000	37.7327
Water						0.0000	0.0000		0.0000	0.0000	1.0583	22.5779	23.6362	0.1096	2.7600e-003	27.1994
Total	**4.7990**	**2.4790**	**8.5175**	**0.0201**	**0.6568**	**0.7135**	**1.3703**	**0.1761**	**0.7130**	**0.8891**	**82.3980**	**1,312.8344**	**1,395.2324**	**1.1625**	**0.0113**	**1,427.6667**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**2.98**	**1.03**	**0.13**	**0.84**	**0.00**	**0.29**	**0.15**	**0.00**	**0.29**	**0.23**	**0.32**	**2.95**	**2.80**	**2.37**	**10.16**	**2.81**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/2/2018	7/13/2018	5	10	
2	Building Construction	Building Construction	7/14/2018	5/31/2019	5	230	
3	Architectural Coating	Architectural Coating	6/29/2019	7/26/2019	5	20	
4	Paving	Paving	6/1/2019	6/28/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 233,280; Residential Outdoor: 77,760; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	23.00	7.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0228	0.2410	0.1124	1.9000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	17.3800	17.3800	5.4100e-003	0.0000	17.5152
Total	**0.0228**	**0.2410**	**0.1124**	**1.9000e-004**	**0.0903**	**0.0129**	**0.1032**	**0.0497**	**0.0119**	**0.0615**	**0.0000**	**17.3800**	**17.3800**	**5.4100e-003**	**0.0000**	**17.5152**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	4.0000e-004	3.5600e-003	1.0000e-005	7.3000e-004	0.0000	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6590	0.6590	3.0000e-005	0.0000	0.6597
Total	**4.6000e-004**	**4.0000e-004**	**3.5600e-003**	**1.0000e-005**	**7.3000e-004**	**0.0000**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6590**	**0.6590**	**3.0000e-005**	**0.0000**	**0.6597**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0228	0.2410	0.1124	1.9000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	17.3799	17.3799	5.4100e-003	0.0000	17.5152
Total	**0.0228**	**0.2410**	**0.1124**	**1.9000e-004**	**0.0903**	**0.0129**	**0.1032**	**0.0497**	**0.0119**	**0.0615**	**0.0000**	**17.3799**	**17.3799**	**5.4100e-003**	**0.0000**	**17.5152**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	4.0000e-004	3.5600e-003	1.0000e-005	7.3000e-004	0.0000	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6590	0.6590	3.0000e-005	0.0000	0.6597
Total	**4.6000e-004**	**4.0000e-004**	**3.5600e-003**	**1.0000e-005**	**7.3000e-004**	**0.0000**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6590**	**0.6590**	**3.0000e-005**	**0.0000**	**0.6597**

3.3 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1621	1.4151	1.0636	1.6300e-003		0.0907	0.0907		0.0853	0.0853	0.0000	143.8492	143.8492	0.0352	0.0000	144.7303
Total	**0.1621**	**1.4151**	**1.0636**	**1.6300e-003**		**0.0907**	**0.0907**		**0.0853**	**0.0853**	**0.0000**	**143.8492**	**143.8492**	**0.0352**	**0.0000**	**144.7303**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8600e-003	0.0516	0.0142	1.3000e-004	2.8300e-003	3.5000e-004	3.1800e-003	8.2000e-004	3.3000e-004	1.1500e-003	0.0000	11.9741	11.9741	1.1200e-003	0.0000	12.0022
Worker	7.0900e-003	6.1600e-003	0.0550	1.1000e-004	0.0112	8.0000e-005	0.0113	2.9800e-003	7.0000e-005	3.0500e-003	0.0000	10.1883	10.1883	4.3000e-004	0.0000	10.1989
Total	**8.9500e-003**	**0.0577**	**0.0693**	**2.4000e-004**	**0.0141**	**4.3000e-004**	**0.0145**	**3.8000e-003**	**4.0000e-004**	**4.2000e-003**	**0.0000**	**22.1623**	**22.1623**	**1.5500e-003**	**0.0000**	**22.2011**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1621	1.4151	1.0636	1.6300e-003		0.0907	0.0907		0.0853	0.0853	0.0000	143.8490	143.8490	0.0352	0.0000	144.7301
Total	**0.1621**	**1.4151**	**1.0636**	**1.6300e-003**		**0.0907**	**0.0907**		**0.0853**	**0.0853**	**0.0000**	**143.8490**	**143.8490**	**0.0352**	**0.0000**	**144.7301**

Mitigated Construction Off-Site

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

Vendor	1.8600e-003	0.0516	0.0142	1.3000e-004	2.8300e-003	3.5000e-004	3.1800e-003	8.2000e-004	3.3000e-004	1.1500e-003	0.0000	11.9741	11.9741	1.1200e-003	0.0000	12.0022
Worker	7.0900e-003	6.1600e-003	0.0550	1.1000e-004	0.0112	8.0000e-005	0.0113	2.9800e-003	7.0000e-005	3.0500e-003	0.0000	10.1883	10.1883	4.3000e-004	0.0000	10.1989
Total	**8.9500e-003**	**0.0577**	**0.0693**	**2.4000e-004**	**0.0141**	**4.3000e-004**	**0.0145**	**3.8000e-003**	**4.0000e-004**	**4.2000e-003**	**0.0000**	**22.1623**	**22.1623**	**1.5500e-003**	**0.0000**	**22.2011**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1287	1.1488	0.9354	1.4700e-003		0.0703	0.0703		0.0661	0.0661	0.0000	128.1318	128.1318	0.0312	0.0000	128.9121
Total	**0.1287**	**1.1488**	**0.9354**	**1.4700e-003**		**0.0703**	**0.0703**		**0.0661**	**0.0661**	**0.0000**	**128.1318**	**128.1318**	**0.0312**	**0.0000**	**128.9121**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4900e-003	0.0435	0.0112	1.1000e-004	2.5500e-003	2.6000e-004	2.8100e-003	7.4000e-004	2.5000e-004	9.9000e-004	0.0000	10.7007	10.7007	9.9000e-004	0.0000	10.7256
Worker	5.7800e-003	4.8500e-003	0.0437	1.0000e-004	0.0101	7.0000e-005	0.0102	2.6900e-003	6.0000e-005	2.7500e-003	0.0000	8.8767	8.8767	3.4000e-004	0.0000	8.8851
Total	**7.2700e-003**	**0.0483**	**0.0549**	**2.1000e-004**	**0.0127**	**3.3000e-004**	**0.0130**	**3.4300e-003**	**3.1000e-004**	**3.7400e-003**	**0.0000**	**19.5774**	**19.5774**	**1.3300e-003**	**0.0000**	**19.6107**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1287	1.1488	0.9354	1.4700e-003		0.0703	0.0703		0.0661	0.0661	0.0000	128.1316	128.1316	0.0312	0.0000	128.9120
Total	**0.1287**	**1.1488**	**0.9354**	**1.4700e-003**		**0.0703**	**0.0703**		**0.0661**	**0.0661**	**0.0000**	**128.1316**	**128.1316**	**0.0312**	**0.0000**	**128.9120**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4900e-003	0.0435	0.0112	1.1000e-004	2.5500e-003	2.6000e-004	2.8100e-003	7.4000e-004	2.5000e-004	9.9000e-004	0.0000	10.7007	10.7007	9.9000e-004	0.0000	10.7256
Worker	5.7800e-003	4.8500e-003	0.0437	1.0000e-004	0.0101	7.0000e-005	0.0102	2.6900e-003	6.0000e-005	2.7500e-003	0.0000	8.8767	8.8767	3.4000e-004	0.0000	8.8851
Total	**7.2700e-003**	**0.0483**	**0.0549**	**2.1000e-004**	**0.0127**	**3.3000e-004**	**0.0130**	**3.4300e-003**	**3.1000e-004**	**3.7400e-003**	**0.0000**	**19.5774**	**19.5774**	**1.3300e-003**	**0.0000**	**19.6107**

3.4 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3604					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	2.6600e-003	0.0184	0.0184	3.0000e-005		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	2.5533	2.5533	2.2000e-004	0.0000	2.5587
Total	**0.3631**	**0.0184**	**0.0184**	**3.0000e-005**		**1.2900e-003**	**1.2900e-003**		**1.2900e-003**	**1.2900e-003**	**0.0000**	**2.5533**	**2.5533**	**2.2000e-004**	**0.0000**	**2.5587**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.9000e-004	1.7400e-003	0.0000	4.0000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3541	0.3541	1.0000e-005	0.0000	0.3544
Total	**2.3000e-004**	**1.9000e-004**	**1.7400e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3541**	**0.3541**	**1.0000e-005**	**0.0000**	**0.3544**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3604					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.6600e-003	0.0184	0.0184	3.0000e-005		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	2.5533	2.5533	2.2000e-004	0.0000	2.5586
Total	**0.3631**	**0.0184**	**0.0184**	**3.0000e-005**		**1.2900e-003**	**1.2900e-003**		**1.2900e-003**	**1.2900e-003**	**0.0000**	**2.5533**	**2.5533**	**2.2000e-004**	**0.0000**	**2.5586**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.9000e-004	1.7400e-003	0.0000	4.0000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3541	0.3541	1.0000e-005	0.0000	0.3544
Total	**2.3000e-004**	**1.9000e-004**	**1.7400e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3541**	**0.3541**	**1.0000e-005**	**0.0000**	**0.3544**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0145	0.1524	0.1467	2.3000e-004		8.2500e-003	8.2500e-003		7.5900e-003	7.5900e-003	0.0000	20.4752	20.4752	6.4800e-003	0.0000	20.6371
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0145**	**0.1524**	**0.1467**	**2.3000e-004**		**8.2500e-003**	**8.2500e-003**		**7.5900e-003**	**7.5900e-003**	**0.0000**	**20.4752**	**20.4752**	**6.4800e-003**	**0.0000**	**20.6371**

Unmitigated Construction Off-Site

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

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	5.8000e-004	5.2300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0622	1.0622	4.0000e-005	0.0000	1.0632
Total	**6.9000e-004**	**5.8000e-004**	**5.2300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0622**	**1.0622**	**4.0000e-005**	**0.0000**	**1.0632**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0145	0.1524	0.1467	2.3000e-004		8.2500e-003	8.2500e-003		7.5900e-003	7.5900e-003	0.0000	20.4752	20.4752	6.4800e-003	0.0000	20.6371
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0145**	**0.1524**	**0.1467**	**2.3000e-004**		**8.2500e-003**	**8.2500e-003**		**7.5900e-003**	**7.5900e-003**	**0.0000**	**20.4752**	**20.4752**	**6.4800e-003**	**0.0000**	**20.6371**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	5.8000e-004	5.2300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0622	1.0622	4.0000e-005	0.0000	1.0632
Total	**6.9000e-004**	**5.8000e-004**	**5.2300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0622**	**1.0622**	**4.0000e-005**	**0.0000**	**1.0632**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2728	2.3112	3.0472	0.0106	0.6568	9.0400e-003	0.6658	0.1761	8.5300e-003	0.1846	0.0000	979.8382	979.8382	0.0815	0.0000	981.8751
Unmitigated	0.2728	2.3112	3.0472	0.0106	0.6568	9.0400e-003	0.6658	0.1761	8.5300e-003	0.1846	0.0000	979.8382	979.8382	0.0815	0.0000	981.8751

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	609.28	634.24	551.68	1,717,185	1,717,185
Total	609.28	634.24	551.68	1,717,185	1,717,185

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.528625	0.038011	0.174732	0.117399	0.021644	0.005996	0.008635	0.089788	0.001426	0.002405	0.009341	0.000716	0.001281

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	184.8564	184.8564	7.6300e-003	1.5800e-003	185.5177
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	191.0101	191.0101	7.8900e-003	1.6300e-003	191.6935
NaturalGas Mitigated	9.8100e-003	0.0838	0.0357	5.3000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	97.0603	97.0603	1.8600e-003	1.7800e-003	97.6371
NaturalGas Unmitigated	0.0128	0.1095	0.0466	7.0000e-004		8.8500e-003	8.8500e-003		8.8500e-003	8.8500e-003	0.0000	126.7972	126.7972	2.4300e-003	2.3200e-003	127.5507

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	2.37609e+006	0.0128	0.1095	0.0466	7.0000e-004		8.8500e-003	8.8500e-003		8.8500e-003	8.8500e-003	0.0000	126.7972	126.7972	2.4300e-003	2.3200e-003	127.5507
Total		**0.0128**	**0.1095**	**0.0466**	**7.0000e-004**		**8.8500e-003**	**8.8500e-003**		**8.8500e-003**	**8.8500e-003**	**0.0000**	**126.7972**	**126.7972**	**2.4300e-003**	**2.3200e-003**	**127.5507**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.81884e+006	9.8100e-003	0.0838	0.0357	5.3000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	97.0603	97.0603	1.8600e-003	1.7800e-003	97.6371
Total		**9.8100e-003**	**0.0838**	**0.0357**	**5.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.7800e-003**	**6.7800e-003**	**0.0000**	**97.0603**	**97.0603**	**1.8600e-003**	**1.7800e-003**	**97.6371**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	599489	191.0101	7.8900e-003	1.6300e-003	191.6935
Total		**191.0101**	**7.8900e-003**	**1.6300e-003**	**191.6935**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	580176	184.8564	7.6300e-003	1.5800e-003	185.5177
Total		**184.8564**	**7.6300e-003**	**1.5800e-003**	**185.5177**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.5163	0.0840	5.4346	9.0100e-003		0.6976	0.6976		0.6976	0.6976	66.1093	28.5015	94.6108	0.0618	5.2000e-003	97.7047
Unmitigated	4.6605	0.0840	5.4346	9.0100e-003		0.6976	0.6976		0.6976	0.6976	66.1093	28.5015	94.6108	0.0618	5.2000e-003	97.7047

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1802					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4499					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.0158	0.0784	4.9570	8.9800e-003		0.6950	0.6950		0.6950	0.6950	66.1093	27.7253	93.8346	0.0610	5.2000e-003	96.9094
Landscaping	0.0146	5.5300e-003	0.4776	3.0000e-005		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	0.7762	0.7762	7.6000e-004	0.0000	0.7953
Total	**4.6605**	**0.0840**	**5.4346**	**9.0100e-003**		**0.6976**	**0.6976**		**0.6976**	**0.6976**	**66.1093**	**28.5015**	**94.6108**	**0.0618**	**5.2000e-003**	**97.7047**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0360					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4499					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.0158	0.0784	4.9570	8.9800e-003		0.6950	0.6950		0.6950	0.6950	66.1093	27.7253	93.8346	0.0610	5.2000e-003	96.9094
Landscaping	0.0146	5.5300e-003	0.4776	3.0000e-005		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	0.7762	0.7762	7.6000e-004	0.0000	0.7953
Total	**4.5163**	**0.0840**	**5.4346**	**9.0100e-003**		**0.6976**	**0.6976**		**0.6976**	**0.6976**	**66.1093**	**28.5015**	**94.6108**	**0.0618**	**5.2000e-003**	**97.7047**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	23.6362	0.1096	2.7600e-003	27.1994

Unmitigated	27.9284	0.1370	3.4400e-003	32.3765

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	4.16986 / 2.62882	27.9284	0.1370	3.4400e-003	32.3765
Total		**27.9284**	**0.1370**	**3.4400e-003**	**32.3765**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	3.33589 / 2.46847	23.6362	0.1096	2.7600e-003	27.1994
Total		**23.6362**	**0.1096**	**2.7600e-003**	**27.1994**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	15.2304	0.9001	0.0000	37.7327
Unmitigated	15.2304	0.9001	0.0000	37.7327

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	75.03	15.2304	0.9001	0.0000	37.7327
Total		**15.2304**	**0.9001**	**0.0000**	**37.7327**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	75.03	15.2304	0.9001	0.0000	37.7327

Total		**15.2304**	**0.9001**	**0.0000**	**37.7327**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Vitorville Residential

Mojave Desert AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	64.00	Dwelling Unit	10.00	115,200.00	183

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	30
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - project description: 10+/- acres

Construction Phase - Site is currently vacant, and no grading is proposed

Area Mitigation - Assume architectural coatings comply with MDAQMD Rule 1113

Energy Mitigation - Assume that the project would comply with the 2016 Title 24 standards at a minimum, which is estimated to be 28% more efficient than 2013 Title 24 Standards for single family homes

Water Mitigation -

Architectural Coating - Assume architectural coatings comply with MDAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	50

tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	50
tblConstructionPhase	PhaseEndDate	9/19/2017	7/26/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	5/31/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	6/28/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	7/13/2018
tblConstructionPhase	PhaseStartDate	9/20/2017	6/29/2019
tblConstructionPhase	PhaseStartDate	9/20/2017	7/14/2018
tblConstructionPhase	PhaseStartDate	9/20/2017	6/1/2019
tblConstructionPhase	PhaseStartDate	9/20/2017	7/2/2018
tblLandUse	LotAcreage	20.78	10.00
tblProjectCharacteristics	OperationalYear	2018	2019

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	4.6698	48.2710	23.3030	0.0397	18.2141	2.5779	20.7920	9.9699	2.3717	12.3416	0.0000	3,992.0534	3,992.0534	1.1997	0.0000	4,022.0447
2019	36.3351	21.9489	18.2860	0.0310	0.2364	1.2959	1.5323	0.0638	1.2185	1.2823	0.0000	3,010.7422	3,010.7422	0.7191	0.0000	3,027.1940
Maximum	**36.3351**	**48.2710**	**23.3030**	**0.0397**	**18.2141**	**2.5779**	**20.7920**	**9.9699**	**2.3717**	**12.3416**	**0.0000**	**3,992.0534**	**3,992.0534**	**1.1997**	**0.0000**	**4,022.0447**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2018	4.6698	48.2710	23.3030	0.0397	18.2141	2.5779	20.7920	9.9699	2.3717	12.3416	0.0000	3,992.0534	3,992.0534	1.1997	0.0000	4,022.0447
2019	36.3351	21.9489	18.2860	0.0310	0.2364	1.2959	1.5323	0.0638	1.2185	1.2823	0.0000	3,010.7422	3,010.7422	0.7191	0.0000	3,027.1940
Maximum	**36.3351**	**48.2710**	**23.3030**	**0.0397**	**18.2141**	**2.5779**	**20.7920**	**9.9699**	**2.3717**	**12.3416**	**0.0000**	**3,992.0534**	**3,992.0534**	**1.1997**	**0.0000**	**4,022.0447**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	101.5604	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111
Energy	0.0702	0.5999	0.2553	3.8300e-003		0.0485	0.0485		0.0485	0.0485		765.8629	765.8629	0.0147	0.0140	770.4140
Mobile	1.8990	13.0904	19.2483	0.0651	3.8528	0.0519	3.9047	1.0315	0.0490	1.0805		6,639.0622	6,639.0622	0.5113		6,651.8441
Total	**103.5296**	**15.6646**	**145.7127**	**0.2882**	**3.8528**	**17.0812**	**20.9340**	**1.0315**	**17.0783**	**18.1098**	**1,777.3908**	**8,159.8442**	**9,937.2350**	**2.1755**	**0.1539**	**10,037.4692**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	100.7705	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111

Energy	0.0537	0.4592	0.1954	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.2505	586.2505	0.0112	0.0108	589.7343
Mobile	1.8990	13.0904	19.2483	0.0651	3.8528	0.0519	3.9047	1.0315	0.0490	1.0805		6,639.0622	6,639.0622	0.5113		6,651.8441
Total	**102.7232**	**15.5239**	**145.6528**	**0.2873**	**3.8528**	**17.0698**	**20.9226**	**1.0315**	**17.0669**	**18.0984**	**1,777.3908**	**7,980.2318**	**9,757.6226**	**2.1721**	**0.1506**	**9,856.7895**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.78**	**0.90**	**0.04**	**0.31**	**0.00**	**0.07**	**0.05**	**0.00**	**0.07**	**0.06**	**0.00**	**2.20**	**1.81**	**0.16**	**2.14**	**1.80**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/2/2018	7/13/2018	5	10	
2	Building Construction	Building Construction	7/14/2018	5/31/2019	5	230	
3	Architectural Coating	Architectural Coating	6/29/2019	7/26/2019	5	20	
4	Paving	Paving	6/1/2019	6/28/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 233,280; Residential Outdoor: 77,760; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37

Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	23.00	7.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**18.0663**	**2.5769**	**20.6432**	**9.9307**	**2.3708**	**12.3014**		**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1071	0.0722	0.8267	1.6200e-003	0.1479	1.0000e-003	0.1489	0.0392	9.2000e-004	0.0401		160.4295	160.4295	6.8200e-003		160.5999
Total	**0.1071**	**0.0722**	**0.8267**	**1.6200e-003**	**0.1479**	**1.0000e-003**	**0.1489**	**0.0392**	**9.2000e-004**	**0.0401**		**160.4295**	**160.4295**	**6.8200e-003**		**160.5999**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**18.0663**	**2.5769**	**20.6432**	**9.9307**	**2.3708**	**12.3014**	**0.0000**	**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Worker	0.1071	0.0722	0.8267	1.6200e-003	0.1479	1.0000e-003	0.1489	0.0392	9.2000e-004	0.0401		160.4295	160.4295	6.8200e-003		160.5999
Total	**0.1071**	**0.0722**	**0.8267**	**1.6200e-003**	**0.1479**	**1.0000e-003**	**0.1489**	**0.0392**	**9.2000e-004**	**0.0401**		**160.4295**	**160.4295**	**6.8200e-003**		**160.5999**

3.3 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0302	0.8424	0.2179	2.1300e-003	0.0475	5.7000e-003	0.0532	0.0137	5.4500e-003	0.0191		222.6196	222.6196	0.0194		223.1056
Worker	0.1369	0.0923	1.0564	2.0600e-003	0.1889	1.2700e-003	0.1902	0.0501	1.1700e-003	0.0513		204.9933	204.9933	8.7100e-003		205.2110
Total	**0.1670**	**0.9347**	**1.2743**	**4.1900e-003**	**0.2364**	**6.9700e-003**	**0.2434**	**0.0638**	**6.6200e-003**	**0.0704**		**427.6128**	**427.6128**	**0.0282**		**428.3166**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**	**0.0000**	**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0302	0.8424	0.2179	2.1300e-003	0.0475	5.7000e-003	0.0532	0.0137	5.4500e-003	0.0191		222.6196	222.6196	0.0194		223.1056
Worker	0.1369	0.0923	1.0564	2.0600e-003	0.1889	1.2700e-003	0.1902	0.0501	1.1700e-003	0.0513		204.9933	204.9933	8.7100e-003		205.2110
Total	**0.1670**	**0.9347**	**1.2743**	**4.1900e-003**	**0.2364**	**6.9700e-003**	**0.2434**	**0.0638**	**6.6200e-003**	**0.0704**		**427.6128**	**427.6128**	**0.0282**		**428.3166**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635

Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0269	0.7893	0.1885	2.1200e-003	0.0475	4.8200e-003	0.0523	0.0137	4.6100e-003	0.0183		220.8738	220.8738	0.0191		221.3507
Worker	0.1239	0.0808	0.9337	1.9900e-003	0.1889	1.2300e-003	0.1902	0.0501	1.1400e-003	0.0513		198.2882	198.2882	7.6600e-003		198.4798
Total	**0.1508**	**0.8701**	**1.1223**	**4.1100e-003**	**0.2364**	**6.0500e-003**	**0.2425**	**0.0638**	**5.7500e-003**	**0.0695**		**419.1621**	**419.1621**	**0.0267**		**419.8305**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0269	0.7893	0.1885	2.1200e-003	0.0475	4.8200e-003	0.0523	0.0137	4.6100e-003	0.0183		220.8738	220.8738	0.0191		221.3507
Worker	0.1239	0.0808	0.9337	1.9900e-003	0.1889	1.2300e-003	0.1902	0.0501	1.1400e-003	0.0513		198.2882	198.2882	7.6600e-003		198.4798
Total	**0.1508**	**0.8701**	**1.1223**	**4.1100e-003**	**0.2364**	**6.0500e-003**	**0.2425**	**0.0638**	**5.7500e-003**	**0.0695**		**419.1621**	**419.1621**	**0.0267**		**419.8305**

3.4 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**36.3082**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0269	0.0176	0.2030	4.3000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		43.1061	43.1061	1.6700e-003		43.1478
Total	**0.0269**	**0.0176**	**0.2030**	**4.3000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**43.1061**	**43.1061**	**1.6700e-003**		**43.1478**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**36.3082**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0269	0.0176	0.2030	4.3000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		43.1061	43.1061	1.6700e-003		43.1478
Total	**0.0269**	**0.0176**	**0.2030**	**4.3000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**43.1061**	**43.1061**	**1.6700e-003**		**43.1478**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586		2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**		**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0808	0.0527	0.6090	1.3000e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		129.3184	129.3184	5.0000e-003		129.4433
Total	**0.0808**	**0.0527**	**0.6090**	**1.3000e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**129.3184**	**129.3184**	**5.0000e-003**		**129.4433**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586	0.0000	2,257.0025	2,257.0025	0.7141		2,274.8548

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**	**0.0000**	**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0808	0.0527	0.6090	1.3000e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		129.3184	129.3184	5.0000e-003		129.4433
Total	**0.0808**	**0.0527**	**0.6090**	**1.3000e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**129.3184**	**129.3184**	**5.0000e-003**		**129.4433**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.8990	13.0904	19.2483	0.0651	3.8528	0.0519	3.9047	1.0315	0.0490	1.0805		6,639.0622	6,639.0622	0.5113		6,651.8441
Unmitigated	1.8990	13.0904	19.2483	0.0651	3.8528	0.0519	3.9047	1.0315	0.0490	1.0805		6,639.0622	6,639.0622	0.5113		6,651.8441

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	609.28	634.24	551.68	1,717,185	1,717,185
Total	609.28	634.24	551.68	1,717,185	1,717,185

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.528625	0.038011	0.174732	0.117399	0.021644	0.005996	0.008635	0.089788	0.001426	0.002405	0.009341	0.000716	0.001281

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0537	0.4592	0.1954	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.2505	586.2505	0.0112	0.0108	589.7343
NaturalGas Unmitigated	0.0702	0.5999	0.2553	3.8300e-003		0.0485	0.0485		0.0485	0.0485		765.8629	765.8629	0.0147	0.0140	770.4140

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	6509.83	0.0702	0.5999	0.2553	3.8300e-003		0.0485	0.0485		0.0485	0.0485		765.8629	765.8629	0.0147	0.0140	770.4140
Total		**0.0702**	**0.5999**	**0.2553**	**3.8300e-003**		**0.0485**	**0.0485**		**0.0485**	**0.0485**		**765.8629**	**765.8629**	**0.0147**	**0.0140**	**770.4140**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	4.98313	0.0537	0.4592	0.1954	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.2505	586.2505	0.0112	0.0108	589.7343
Total		**0.0537**	**0.4592**	**0.1954**	**2.9300e-003**		**0.0371**	**0.0371**		**0.0371**	**0.0371**		**586.2505**	**586.2505**	**0.0112**	**0.0108**	**589.7343**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	100.7705	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111
Unmitigated	101.5604	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4653					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	97.9453	1.9128	120.9028	0.2190		16.9517	16.9517		16.9517	16.9517	1,777.3908	745.4118	2,522.8025	1.6402	0.1398	2,605.4704
Landscaping	0.1624	0.0615	5.3062	2.8000e-004		0.0291	0.0291		0.0291	0.0291		9.5074	9.5074	9.3300e-003		9.7407
Total	**101.5604**	**1.9742**	**126.2090**	**0.2193**		**16.9808**	**16.9808**		**16.9808**	**16.9808**	**1,777.3908**	**754.9191**	**2,532.3099**	**1.6496**	**0.1398**	**2,615.2111**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

SubCategory	lb/day										lb/day					
Architectural Coating	0.1975					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4653					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	97.9453	1.9128	120.9028	0.2190		16.9517	16.9517		16.9517	16.9517	1,777.3908	745.4118	2,522.8025	1.6402	0.1398	2,605.4704
Landscaping	0.1624	0.0615	5.3062	2.8000e-004		0.0291	0.0291		0.0291	0.0291		9.5074	9.5074	9.3300e-003		9.7407
Total	**100.7705**	**1.9742**	**126.2090**	**0.2193**		**16.9808**	**16.9808**		**16.9808**	**16.9808**	**1,777.3908**	**754.9191**	**2,532.3099**	**1.6496**	**0.1398**	**2,615.2111**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Vitorville Residential

Mojave Desert AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	64.00	Dwelling Unit	10.00	115,200.00	183

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	30
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - project description: 10+/- acres

Construction Phase - Site is currently vacant, and no grading is proposed

Area Mitigation - Assume architectural coatings comply with MDAQMD Rule 1113

Energy Mitigation - Assume that the project would comply with the 2016 Title 24 standards at a minimum, which is estimated to be 28% more efficient than 2013 Title 24 Standards for single family homes

Water Mitigation -

Architectural Coating - Assume architectural coatings comply with MDAQMD Rule 1113

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	50

tblAreaMitigation	UseLowVOCPaintResidentialInteriorVa lue	250	50
tblConstructionPhase	PhaseEndDate	9/19/2017	7/26/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	5/31/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	6/28/2019
tblConstructionPhase	PhaseEndDate	9/19/2017	7/13/2018
tblConstructionPhase	PhaseStartDate	9/20/2017	6/29/2019
tblConstructionPhase	PhaseStartDate	9/20/2017	7/14/2018
tblConstructionPhase	PhaseStartDate	9/20/2017	6/1/2019
tblConstructionPhase	PhaseStartDate	9/20/2017	7/2/2018
tblLandUse	LotAcreage	20.78	10.00
tblProjectCharacteristics	OperationalYear	2018	2019

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	4.6633	48.2732	23.1395	0.0395	18.2141	2.5779	20.7920	9.9699	2.3717	12.3416	0.0000	3,972.5342	3,972.5342	1.1987	0.0000	4,002.5013
2019	36.3335	21.9410	18.1293	0.0307	0.2364	1.2960	1.5324	0.0638	1.2185	1.2823	0.0000	2,976.0158	2,976.0158	0.7184	0.0000	2,992.4977
Maximum	**36.3335**	**48.2732**	**23.1395**	**0.0395**	**18.2141**	**2.5779**	**20.7920**	**9.9699**	**2.3717**	**12.3416**	**0.0000**	**3,972.5342**	**3,972.5342**	**1.1987**	**0.0000**	**4,002.5013**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2018	4.6633	48.2732	23.1395	0.0395	18.2141	2.5779	20.7920	9.9699	2.3717	12.3416	0.0000	3,972.5342	3,972.5342	1.1987	0.0000	4,002.5013
2019	36.3335	21.9410	18.1293	0.0307	0.2364	1.2960	1.5324	0.0638	1.2185	1.2823	0.0000	2,976.0158	2,976.0158	0.7184	0.0000	2,992.4977
Maximum	**36.3335**	**48.2732**	**23.1395**	**0.0395**	**18.2141**	**2.5779**	**20.7920**	**9.9699**	**2.3717**	**12.3416**	**0.0000**	**3,972.5342**	**3,972.5342**	**1.1987**	**0.0000**	**4,002.5013**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	101.5604	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111
Energy	0.0702	0.5999	0.2553	3.8300e-003		0.0485	0.0485		0.0485	0.0485		765.8629	765.8629	0.0147	0.0140	770.4140
Mobile	1.6131	12.9542	16.7895	0.0591	3.8528	0.0525	3.9053	1.0315	0.0496	1.0811		6,037.4433	6,037.4433	0.5340		6,050.7937
Total	**103.2437**	**15.5284**	**143.2538**	**0.2823**	**3.8528**	**17.0818**	**20.9346**	**1.0315**	**17.0789**	**18.1104**	**1,777.3908**	**7,558.2253**	**9,335.6161**	**2.1983**	**0.1539**	**9,436.4188**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	100.7705	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111

Energy	0.0537	0.4592	0.1954	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.2505	586.2505	0.0112	0.0108	589.7343
Mobile	1.6131	12.9542	16.7895	0.0591	3.8528	0.0525	3.9053	1.0315	0.0496	1.0811		6,037.4433	6,037.4433	0.5340		6,050.7937
Total	**102.4373**	**15.3877**	**143.1940**	**0.2814**	**3.8528**	**17.0704**	**20.9232**	**1.0315**	**17.0675**	**18.0990**	**1,777.3908**	**7,378.6129**	**9,156.0037**	**2.1948**	**0.1506**	**9,255.7391**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.78**	**0.91**	**0.04**	**0.32**	**0.00**	**0.07**	**0.05**	**0.00**	**0.07**	**0.06**	**0.00**	**2.38**	**1.92**	**0.16**	**2.14**	**1.91**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/2/2018	7/13/2018	5	10	
2	Building Construction	Building Construction	7/14/2018	5/31/2019	5	230	
3	Architectural Coating	Architectural Coating	6/29/2019	7/26/2019	5	20	
4	Paving	Paving	6/1/2019	6/28/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 233,280; Residential Outdoor: 77,760; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37

Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	23.00	7.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**18.0663**	**2.5769**	**20.6432**	**9.9307**	**2.3708**	**12.3014**		**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1006	0.0744	0.6632	1.4200e-003	0.1479	1.0000e-003	0.1489	0.0392	9.2000e-004	0.0401		140.9103	140.9103	5.8500e-003		141.0565
Total	**0.1006**	**0.0744**	**0.6632**	**1.4200e-003**	**0.1479**	**1.0000e-003**	**0.1489**	**0.0392**	**9.2000e-004**	**0.0401**		**140.9103**	**140.9103**	**5.8500e-003**		**141.0565**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	**4.5627**	**48.1988**	**22.4763**	**0.0380**	**18.0663**	**2.5769**	**20.6432**	**9.9307**	**2.3708**	**12.3014**	**0.0000**	**3,831.6239**	**3,831.6239**	**1.1928**		**3,861.4448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Worker	0.1006	0.0744	0.6632	1.4200e-003	0.1479	1.0000e-003	0.1489	0.0392	9.2000e-004	0.0401		140.9103	140.9103	5.8500e-003		141.0565
Total	**0.1006**	**0.0744**	**0.6632**	**1.4200e-003**	**0.1479**	**1.0000e-003**	**0.1489**	**0.0392**	**9.2000e-004**	**0.0401**		**140.9103**	**140.9103**	**5.8500e-003**		**141.0565**

3.3 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**		**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0318	0.8330	0.2479	2.0300e-003	0.0475	5.7500e-003	0.0532	0.0137	5.5000e-003	0.0192		212.0193	212.0193	0.0217		212.5621
Worker	0.1286	0.0951	0.8474	1.8100e-003	0.1889	1.2700e-003	0.1902	0.0501	1.1700e-003	0.0513		180.0521	180.0521	7.4700e-003		180.2388
Total	**0.1604**	**0.9281**	**1.0953**	**3.8400e-003**	**0.2364**	**7.0200e-003**	**0.2434**	**0.0638**	**6.6700e-003**	**0.0705**		**392.0714**	**392.0714**	**0.0292**		**392.8010**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883
Total	**2.6795**	**23.3900**	**17.5804**	**0.0269**		**1.4999**	**1.4999**		**1.4099**	**1.4099**	**0.0000**	**2,620.9351**	**2,620.9351**	**0.6421**		**2,636.9883**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0318	0.8330	0.2479	2.0300e-003	0.0475	5.7500e-003	0.0532	0.0137	5.5000e-003	0.0192		212.0193	212.0193	0.0217		212.5621
Worker	0.1286	0.0951	0.8474	1.8100e-003	0.1889	1.2700e-003	0.1902	0.0501	1.1700e-003	0.0513		180.0521	180.0521	7.4700e-003		180.2388
Total	**0.1604**	**0.9281**	**1.0953**	**3.8400e-003**	**0.2364**	**7.0200e-003**	**0.2434**	**0.0638**	**6.6700e-003**	**0.0705**		**392.0714**	**392.0714**	**0.0292**		**392.8010**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635

Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0285	0.7790	0.2184	2.0100e-003	0.0475	4.8600e-003	0.0523	0.0137	4.6500e-003	0.0183		210.2952	210.2952	0.0214		210.8299
Worker	0.1165	0.0832	0.7472	1.7500e-003	0.1889	1.2300e-003	0.1902	0.0501	1.1400e-003	0.0513		174.1405	174.1405	6.5500e-003		174.3043
Total	**0.1450**	**0.8622**	**0.9655**	**3.7600e-003**	**0.2364**	**6.0900e-003**	**0.2425**	**0.0638**	**5.7900e-003**	**0.0696**		**384.4357**	**384.4357**	**0.0279**		**385.1342**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0285	0.7790	0.2184	2.0100e-003	0.0475	4.8600e-003	0.0523	0.0137	4.6500e-003	0.0183		210.2952	210.2952	0.0214		210.8299
Worker	0.1165	0.0832	0.7472	1.7500e-003	0.1889	1.2300e-003	0.1902	0.0501	1.1400e-003	0.0513		174.1405	174.1405	6.5500e-003		174.3043
Total	**0.1450**	**0.8622**	**0.9655**	**3.7600e-003**	**0.2364**	**6.0900e-003**	**0.2425**	**0.0638**	**5.7900e-003**	**0.0696**		**384.4357**	**384.4357**	**0.0279**		**385.1342**

3.4 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**36.3082**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0253	0.0181	0.1624	3.8000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		37.8566	37.8566	1.4200e-003		37.8922
Total	**0.0253**	**0.0181**	**0.1624**	**3.8000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**37.8566**	**37.8566**	**1.4200e-003**		**37.8922**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**36.3082**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0253	0.0181	0.1624	3.8000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		37.8566	37.8566	1.4200e-003		37.8922
Total	**0.0253**	**0.0181**	**0.1624**	**3.8000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**37.8566**	**37.8566**	**1.4200e-003**		**37.8922**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586		2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**		**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0760	0.0543	0.4873	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.5699	113.5699	4.2700e-003		113.6767
Total	**0.0760**	**0.0543**	**0.4873**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.5699**	**113.5699**	**4.2700e-003**		**113.6767**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586	0.0000	2,257.0025	2,257.0025	0.7141		2,274.8548

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**	**0.0000**	**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0760	0.0543	0.4873	1.1400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		113.5699	113.5699	4.2700e-003		113.6767
Total	**0.0760**	**0.0543**	**0.4873**	**1.1400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**113.5699**	**113.5699**	**4.2700e-003**		**113.6767**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6131	12.9542	16.7895	0.0591	3.8528	0.0525	3.9053	1.0315	0.0496	1.0811		6,037.4433	6,037.4433	0.5340		6,050.7937
Unmitigated	1.6131	12.9542	16.7895	0.0591	3.8528	0.0525	3.9053	1.0315	0.0496	1.0811		6,037.4433	6,037.4433	0.5340		6,050.7937

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	609.28	634.24	551.68	1,717,185	1,717,185
Total	609.28	634.24	551.68	1,717,185	1,717,185

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.528625	0.038011	0.174732	0.117399	0.021644	0.005996	0.008635	0.089788	0.001426	0.002405	0.009341	0.000716	0.001281

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0537	0.4592	0.1954	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.2505	586.2505	0.0112	0.0108	589.7343
NaturalGas Unmitigated	0.0702	0.5999	0.2553	3.8300e-003		0.0485	0.0485		0.0485	0.0485		765.8629	765.8629	0.0147	0.0140	770.4140

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	6509.83	0.0702	0.5999	0.2553	3.8300e-003		0.0485	0.0485		0.0485	0.0485		765.8629	765.8629	0.0147	0.0140	770.4140
Total		**0.0702**	**0.5999**	**0.2553**	**3.8300e-003**		**0.0485**	**0.0485**		**0.0485**	**0.0485**		**765.8629**	**765.8629**	**0.0147**	**0.0140**	**770.4140**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	4.98313	0.0537	0.4592	0.1954	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.2505	586.2505	0.0112	0.0108	589.7343
Total		**0.0537**	**0.4592**	**0.1954**	**2.9300e-003**		**0.0371**	**0.0371**		**0.0371**	**0.0371**		**586.2505**	**586.2505**	**0.0112**	**0.0108**	**589.7343**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	100.7705	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111
Unmitigated	101.5604	1.9742	126.2090	0.2193		16.9808	16.9808		16.9808	16.9808	1,777.3908	754.9191	2,532.3099	1.6496	0.1398	2,615.2111

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9875					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4653					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	97.9453	1.9128	120.9028	0.2190		16.9517	16.9517		16.9517	16.9517	1,777.3908	745.4118	2,522.8025	1.6402	0.1398	2,605.4704
Landscaping	0.1624	0.0615	5.3062	2.8000e-004		0.0291	0.0291		0.0291	0.0291		9.5074	9.5074	9.3300e-003		9.7407
Total	**101.5604**	**1.9742**	**126.2090**	**0.2193**		**16.9808**	**16.9808**		**16.9808**	**16.9808**	**1,777.3908**	**754.9191**	**2,532.3099**	**1.6496**	**0.1398**	**2,615.2111**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

SubCategory	lb/day										lb/day					
Architectural Coating	0.1975					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.4653					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	97.9453	1.9128	120.9028	0.2190		16.9517	16.9517		16.9517	16.9517	1,777.3908	745.4118	2,522.8025	1.6402	0.1398	2,605.4704
Landscaping	0.1624	0.0615	5.3062	2.8000e-004		0.0291	0.0291		0.0291	0.0291		9.5074	9.5074	9.3300e-003		9.7407
Total	**100.7705**	**1.9742**	**126.2090**	**0.2193**		**16.9808**	**16.9808**		**16.9808**	**16.9808**	**1,777.3908**	**754.9191**	**2,532.3099**	**1.6496**	**0.1398**	**2,615.2111**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation