Harmony Grove Village South

Appendix H

Air Quality Analysis Report

for the

Final Environmental Impact Report

PDS2015-GPA-15-002
PDS2015-SP-15-002
PDS-REZ-15-003
PDS2018-TM-5626
PDS2015-MUP-15-008
Log No.: PDS2015-ER-15-08-006

July 2018

Prepared for:
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HELIX
Environmental Planning

Harmony Grove Village South Project

Air Quality Analysis Report

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April 2017

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Harmony Grove Village South Project

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GLOSSARY OF TERMS AND ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
ADT	average daily trips
AMSL	above mean sea level
ANFO	ammonium nitrate/fuel oil
APN	Assessor's Parcel Number
AQIA	Air Quality Impact Assessment
BMPs	best management practices
CAA	Clean Air Act (Federal)
CAAQS	California Ambient Air Quality Standard
CalEEMod	California Emission Estimator Model
CalEPA	California Environmental Protection Agency
CALINE4	California Line Source Dispersion Model (Version 4)
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CDPM	Construction Cancer Risk DPM
CEQA	California Environmental Quality Act
CO	carbon monoxide
County	County of San Diego
CPF	cancer potency factor
DPM	diesel particulate matter
DU	dwelling unit
g/L	grams per liter
gpd	gallons per day
H_2S	hydrogen sulfide
HGV	Harmony Grove Village
HI	hazard index
HQ	hazard quotient
I-15	Interstate 15
lbs	pounds
LOS	level of service
MEI	maximum exposed individual
mgd	million gallons per day
mph	miles per hour

GLOSSARY OF TERMS AND ACRONYMS (cont.)

NAAQS	National Ambient Air Quality Standard
NO	nitrogen oxide
NO_X	oxides of nitrogen
NO_2	nitrogen dioxide
O_3	Ozone
OEHHA	California Office of Environmental Health Hazard Assessment
Pb	lead
PM_{10}	respirable particulate matter (particulate matter with an aerodynamic diameter of 10 microns or less)
$PM_{2.5}$	fine particulate matter (particulate matter with an aerodynamic diameter of 2.5 microns or less)
ppb	parts per billion
ppm	parts per million
Project	Harmony Grove Village South
PVC	polyvinyl chloride
RAQS	San Diego County Regional Air Quality Strategy
REL	reference exposure levels
Roadway Model	Road Construction Emissions Model
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SCAQMD	South Coast Air Quality Management District
SDAB	San Diego Air Basin
SDAPCD	San Diego County Air Pollution Control District
SDG&E	San Diego Gas & Electric
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_X	oxides of sulfur
SO_2	sulfur dioxide
SPV	San Pasqual Valley
SR	State Route
TACs	Toxic Air Contaminants
T-BACT	Toxics Best Available Control Technology
TIA	Traffic Impact Analysis
TSP	total suspended particulate

GLOSSARY OF TERMS AND ACRONYMS (cont.)

VMT	vehicle miles traveled
VOCs	volatile organic compounds
WTWRF	wastewater treatment and water reclamation facility
WRCC	Western Regional Climate Center
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

This report presents an assessment of potential air quality impacts associated with the proposed Harmony Grove Village (HGV) South Project (Proposed Project or Project). The evaluation addresses the potential for air pollutant emissions during construction and after full buildout of the Project.

As discussed in Section 4.1.2, the Project would increase density in terms of the number of dwelling units (DUs) compared to what was assumed in the County of San Diego General Plan. This could create potential interference with the Regional Air Quality Strategy (RAQS) and, therefore, Project-level and cumulative impacts would be significant.

The Project would result in emissions of air pollutants during both the construction phase and operational phase of the Project. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment, and construction workers commuting to and from the site. The Project would incorporate measures to minimize fugitive dust control emissions, including watering twice per day during grading and stabilization of storage piles. Construction is assumed to begin in 2018 and last approximately three years. With implementation of Project design features and construction best management practices (BMPs), short-term impacts associated with construction activities would be less than significant.

The main operational emissions associated with the Project would include impacts associated with vehicular traffic, as well as area sources such as energy use, landscaping, and the use of consumer products. A wide range of current regulatory codes, Project design features, and other measures would be incorporated into the Proposed Project. The Project would incorporate energy-efficiency features that would meet 2016 California Title 24 Energy Efficiency Standards. The installation of natural gas fireplaces would prevent residences from using wood as fuel for fire and prevent the generation of particulate emissions in the area. Emissions during operation of the Project would not exceed the daily screening level thresholds for any of the criteria pollutants. The Project would not result in cumulatively considerable emissions of nonattainment air pollutants that would exceed the screening level thresholds.

Quantitative screening-level health risk assessments were conducted to assess impacts to sensitive receptors from toxic air contaminants (TACs) during construction activities as well as operation of the wastewater treatment and water reclamation facility (WTWRF). Both construction and operation impacts were found to be less than significant.

The Project would not place sensitive receptors near major sources of air pollution or result in the exposure of sensitive receptors to substantial emissions of pollutants. Additionally, the Project would not result in the degradation of roadway intersections such that emissions of carbon monoxide (CO) would exceed state or federal standards that would result in a CO hotspot. An evaluation of potential odors from construction activities and Project operation indicated that the Project would not expose substantial numbers of people to objectionable odors.

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Purpose of The Report

This report analyzes potential air quality impacts associated with the proposed Harmony Grove Village (HGV) South Project (Proposed Project or Project), which includes an evaluation of existing conditions in the Project vicinity, an assessment of potential impacts associated with Project construction, and an evaluation of Project operational impacts. The analysis of impacts and report is prepared in accordance with the County of San Diego Guidelines for Determining Significance and Report Content and Format Requirement for Air Quality (County 2007).

1.2 Project Location and Description

The Project includes an approximately 111-acre site in an unincorporated portion of San Diego County (County) in the community of Harmony Grove (see Figure 1, *Regional Location Map*). The Project contains parcels with the following Assessor's Parcel Numbers (APNs): 235-011-06-00, 238-021-08-00, 238-021-09-00 and 238-021-10-00. The Project site is located approximately 2.5 miles west of Interstate 15 (I-15) and approximately 2.6 miles south of State Route 78 (SR 78). Escondido Creek flows east-west just north of the Project, and the City of Escondido is located to the east. The community of Elfin Forest is located to the west. County open-space parcels (the Del Dios Highland Preserve) abut the southern boundary of the Project. The western Project boundary abuts Country Club Drive. Primary access to the Project vicinity is provided by Harmony Grove Road and Country Club Drive (see Figure 2, *Project Vicinity Map*).

The Proposed Project would contain 453 residential units and a small commercial area with limited retail/commercial uses (the Center House). The total square footage of structures associated with the Center House use would be approximately 5,000 square feet, with a minimum of 500 square feet of commercial use. The residential units would be a mix of multi- and single-family units.

The Project design includes an on-site wastewater treatment and water reclamation facility (WTWRF) located in the northwestern portion of the site.[1] This facility would provide treatment for all wastewater generated on site, and would produce reclaimed effluent per applicable regulatory standards for irrigation of on-site landscaping. Based on the loading and design criteria used in the 180,000 gallons per day (gpd) Harmony Grove plant design that serves 1,951 residents, a scaled-down version could be constructed to serve the Proposed Project.

Two primary Project entries would be provided from Country Club Drive south of the Escondido Creek Crossing. The first would be located approximately one-quarter mile south of the intersection with Harmony Grove Road and would provide direct access to the destination gathering location and Paseo and Court housing. A second entrance would be located approximately 200 feet north of Cordrey Drive and would provide direct access to Project Compound and Villa housing.

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[1] As described in the Project EIR Chapter 4.0, Alternatives, alternative design scenarios were evaluated for the treatment of wastewater. Of the possible scenarios, the full on-site WTWRF proposed for the Project would result in the greatest emissions, and was therefore included in this analysis as a worst case.

1.3 Project Design Features and Best Management Practices

1.3.1 Regulatory Requirements

Construction Measures

The Project would incorporate best management practices (BMPs) during construction to reduce emissions of fugitive dust. SDAPCD Rule 55 – Fugitive Dust Control states that no dust and/or dirt shall leave the property line. SDAPCD Rule 55 requires the following:

1. **Airborne Dust Beyond the Property Line:** No person shall engage in construction or demolition activity subject to this rule in a manner that discharges visible dust emissions into the atmosphere beyond the property line for a period or periods aggregating more than 3 minutes in any 60-minute period.

2. **Track-Out/Carry-Out:** Visible roadway dust as a result of active operations, spillage from transport trucks, erosion, or track-out/carry-out shall:

   (i) be minimized by the use of any of the following or equally effective trackout/carry-out and erosion control measures that apply to the Project or operation:

      (a) track-out grates or gravel beds at each egress point;

      (b) wheel-washing at each egress during muddy conditions, soil binders, chemical soil stabilizers, geotextiles, mulching, or seeding; and for outbound transport trucks; and

      (c) using secured tarps or cargo covering, watering, or treating of transported material.

   (ii) be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. If a street sweeper is used to remove any track-out/carry-out, only PM_{10}-efficient street sweepers certified to meet the most current South Coast Air Quality Management District (SCAQMD) Rule 1186 requirements shall be used. The use of blowers for removal of track-out/ carry-out is prohibited under any circumstances.

Area Source Reductions

- Use of low- volatile organic compound (VOC) coatings in accordance with, or exceeding, SDAPCD Rule 67
  - Residential interior coatings are to be less than or equal to 50 grams of VOC per liter (g/L)
  - Residential exterior coatings are to be less than or equal to 100 g/L
  - Non-residential interior/exterior coatings are to be less than or equal to 100 g/L

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Regional Location Map

HARMONY GROVE VILLAGE SOUTH

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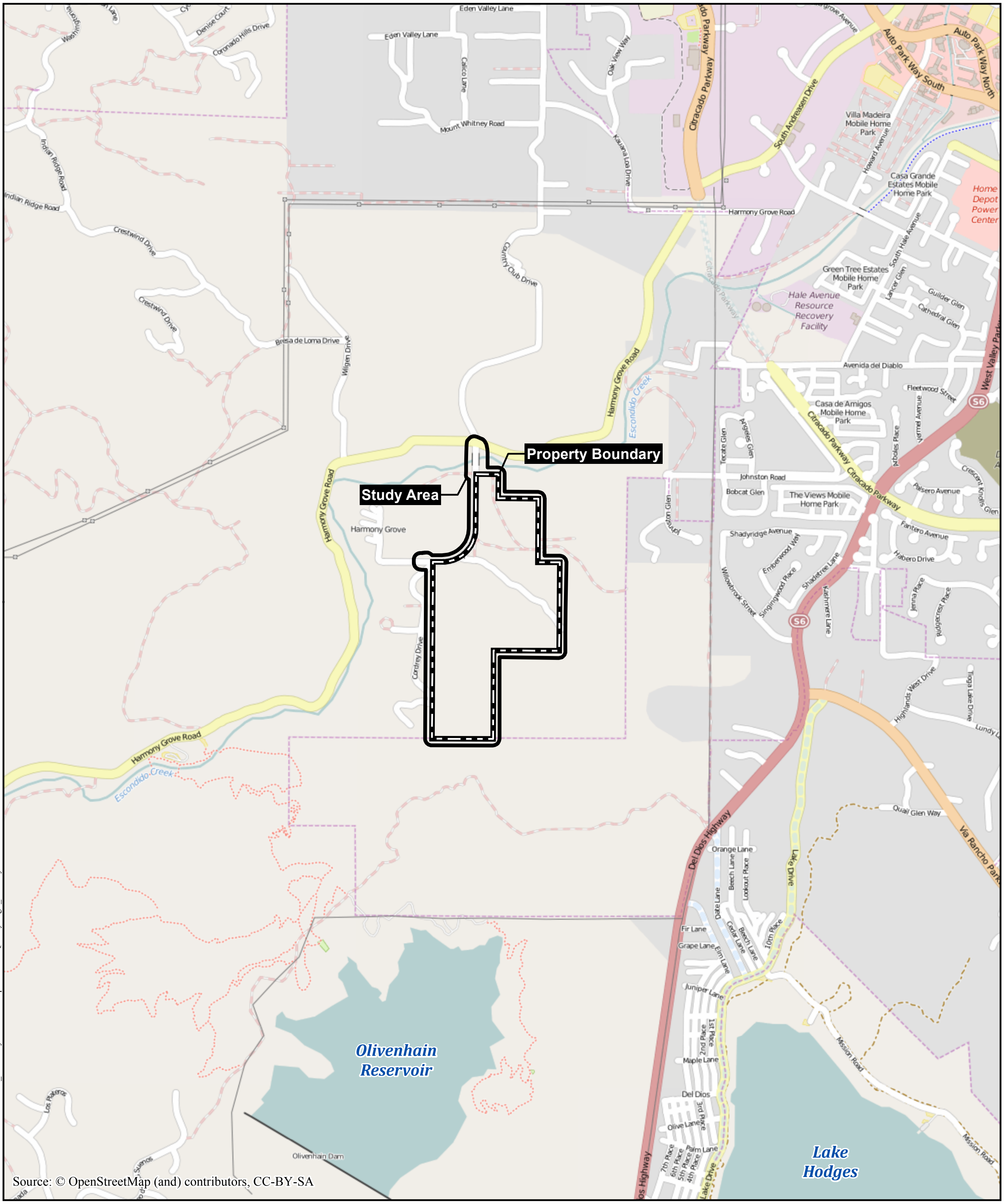
0 8 Miles

Figure 1



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Project Vicinity Map

HARMONY GROVE VILLAGE SOUTH

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2

Energy Efficiencies

- The Project will be designed to meet 2016 Title 24 energy efficiency standards

1.3.2 Construction Best Management Practices

The control measures listed below are the BMPs that the Project would incorporate for dust control:

- The Project applicant will require the contractor(s) to implement paving, chip sealing or chemical stabilization of internal roadways after completion of grading.
- Dirt storage piles will be stabilized by chemical binders, tarps, fencing or other erosion control.
- A 15-mile per hour (mph) speed limit will be enforced on unpaved surfaces.
- On dry days, dirt and debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction-related dirt in dry weather.
- Haul trucks hauling dirt, sand, soil, or other loose materials will be covered or two feet of freeboard will be maintained.
- Disturbed areas shall be hydroseeded, landscaped, or developed as quickly as possible and as directed by the County and/or SDAPCD to reduce dust generation.
- Grading will be terminated if winds exceed 25 mph.
- Any blasting areas would be wetted down prior to initiating the blast.
- In accordance with CALGreen criteria and state and local laws, at least 50 percent of on-site construction waste and ongoing operational waste would be diverted from landfills through reuse and recycling.

1.3.3 Project Design Features

In addition, the Project proposes design features which would reduce the operational emissions of criteria air pollutants associated with the Proposed Project. These design features would be included as building permit conditions and verified prior to the issuance of final certificate of occupancy. These include, but are not limited to, the following:

Area Source Reductions

- Only natural gas fireplaces are to be installed in residences, which would prevent residences from using wood as fuel for fire and prevent the generation of PM_{10} emissions in the area

Energy Efficiencies

- Renewable energy would supply 100 percent of the Project's electricity needs through the required installation of rooftop solar PV panels (a photovoltaic system) on all residential units, the Center House and WTWRF located within the Project site. As an alternative to the installation of PV panels on a particular building unit, enrollment in a renewables program similar to SDG&E's SunRate may be substituted if the program can be verified to supply 100 percent of the electricity needs from renewable sources for that building unit for the life of that unit. The applicant must provide the County with documentation that the program meets the requirements stated herein by supplying the building unit with its electricity needs from renewable sources over the lifetime of the building. With each building permit, the estimated number of units requiring the installation of solar panel will be provided to the County to determine the overall remaining number of units needed to comply with this measure.

- Installation of electrical outlets on the exterior walls of residences to promote the use of electric landscape maintenance equipment.

- Notices will be provided to homebuyers of incentive and rebate programs available through SDG&E or other providers that encourage the purchase of electric landscape maintenance equipment.

- Installation of an electric vehicle re-charging station in the parking area for the Center House.

WTWRF Odor Controls

If the on-site WTWRF option is chosen, the following Project design features will be included:

- As relevant, all WTWRF facilities will be designed to minimize odors, including the addition of water misting, chemical additives or activated carbon, as required.

- All WTWRF facilities would be covered or housed to avoid uncontrolled odor release.

- Active odor control units would be located to manage gases from the wet and solids stream treatment processes.

- A misting system with odor neutralizing liquids to break down the foul smelling chemical compounds in the biogases would be installed.

- Bio filters would be utilized to capture odor causing compounds in a media bed where they are oxidized by naturally occurring micro-organisms.

2.0 EXISTING CONDITIONS

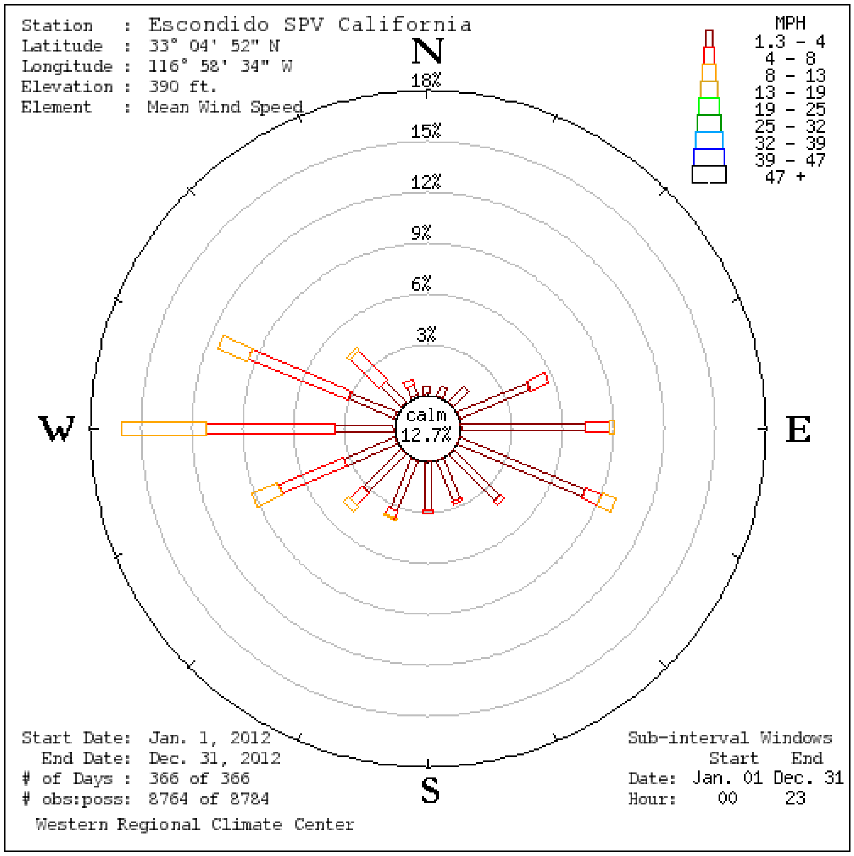
2.1 Existing Setting

The Project site is located west of I-15 and south of Harmony Grove Road in a semi-rural area, encompassing a mix of urban development and open space. The Project site consists of hilly terrain with elevations on the property ranging from approximately 570 to 938 feet above mean sea level (AMSL).

2.2 Climate / Meteorology and Temperature Inversions

The climate in southern California, including the San Diego Air Basin (SDAB) in which the Project site is located in, is controlled largely by the strength and position of the subtropical high-pressure cell over the Pacific Ocean. Areas within 30 miles of the coast experience moderate temperatures and comfortable humidity. Precipitation is limited to a few storms during the winter season. The climate of San Diego County is characterized by hot, dry summers, and mild, wet winters.

Figure 3, *Wind Rose – Escondido San Pasqual Valley (SPV) Monitoring Station***,** presents a wind rose from the monitoring station for 2012, which is the closest monitoring station to the Project and represents general meteorological trends for the area. Wind monitoring data recorded at the Escondido SPV Monitoring Station indicated that the predominant wind direction in the vicinity of the Project site is from the west. Average wind speed in the vicinity is approximately four mph. The annual average temperature in the Project area is approximately 55 degrees Fahrenheit (°F) during the winter and approximately 74°F during the summer. Total precipitation in the Project area averages approximately 16.2 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer (Western Regional Climate Center [WRCC] 2014).



Source: WRCC 2014

Figure 3
Wind Rose – Escondido SPV Monitoring Station

The atmospheric conditions of the SDAB contribute to the region's air quality problems. The high-pressure cell also creates two types of temperature inversions that may act to degrade local air quality. Subsidence inversions occur during the warmer months as descending air associated with the Pacific high-pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools through radiation and the air aloft remain warm. The shallow inversion layer formed between these two air masses can also trap pollutants.

Due to its climate, the SDAB experiences frequent temperature inversions. Typically, temperature decreases with height. However, under inversion conditions, temperature increases as altitude increases. Temperature inversions prevent air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created due to the interaction between the ocean surface and the lower layer of the atmosphere, creating a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and nitrogen dioxide (NO_2) react under strong sunlight, creating smog. Light, daytime winds, predominately from the west, further aggravate the condition by driving the air pollutants inland, toward the foothills. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and NO_2 emissions. High NO_2 levels usually occur during autumn or winter, on days with summer-like conditions.

High air pollution levels in coastal communities of San Diego often occur when polluted air from the South Coast Air Basin, particularly Los Angeles, travels southwest over the ocean at night, and is brought onshore into San Diego by the sea breeze during the day. Smog transported from the Los Angeles area is a key factor on more than 50 percent of the days San Diego exceeds clean air standards. Ozone (O_3) and precursor emissions are transported to San Diego during relatively mild Santa Ana weather conditions. However, during strong Santa Ana weather conditions, pollutants are pushed far out to sea and miss San Diego. When smog is blown in to the SDAB at ground level, the highest O_3 concentrations are measured at coastal and near-coastal monitoring stations. When the transported smog is elevated, coastal sites may be passed over, and the transported ozone is measured further inland and on the mountain slopes. Figure 3 provides a graphic representation of the prevailing winds in the Project vicinity, as measured at the Escondido SPV Monitoring Station. The high-pressure cell also creates two types of temperature inversions that may act to degrade local air quality.

2.3 AIR POLLUTANTS OF CONCERN

Criteria Air Pollutants

Federal and state laws regulate air pollutants emitted into the ambient air by stationary and mobile sources. These regulated air pollutants are known as "criteria air pollutants" and are categorized as primary and secondary standards. Primary standards are set of limits based on human health. Another set of limits intended to prevent environmental and property damage is called secondary standards. Criteria pollutants are defined by state and federal law as a risk to the health and welfare of the general public.

The following specific descriptions of health effects for each air pollutant associated with Project construction and operation are based on USEPA (USEPA 2007) and California Air Resources Board (CARB 2009).

Ozone. O_3 is considered a photochemical oxidant, which is a chemical that is formed when VOCs and oxides of nitrogen (NO_X), both by-products of fuel combustion, react in the presence of ultraviolet light. Ozone is considered a respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at greatest risk from exposure to ozone.

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

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

Respirable Particulate Matter and Fine Particulate Matter. Respirable particulate matter, or PM_{10}, refers to particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter, or $PM_{2.5}$, refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. Particulate matter in these size ranges has been determined to have the potential to lodge in the lungs and contribute to respiratory problems. PM_{10} and $PM_{2.5}$ arise from a variety of sources, including road dust, diesel exhaust, fuel combustion, tire and brake wear, construction operations and windblown dust. PM_{10} and $PM_{2.5}$ can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases such as asthma and chronic bronchitis. $PM_{2.5}$ is considered to have the potential to lodge deeper in the lungs.

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

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

Sulfates. Sulfates are the fully oxidized ionic form of sulfur. 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 CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and due to fact that they are usually acidic, can harm ecosystems and damage materials and property.

Hydrogen Sulfide. Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing H_2S at levels above the standard would result in exposure to a very disagreeable odor. In 1984, a CARB committee concluded that the ambient standard for H_2S is adequate to protect public health and to significantly reduce odor annoyance.

Vinyl Chloride. Vinyl chloride, a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants and hazardous waste sites, due to microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure causes liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer, in humans.

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 such as metals, soot, soil, dust, and salt. These particles in the atmosphere would obstruct the range of visibility. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze.

Toxic Air Contaminants

The public's exposure to toxic air contaminants (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. The Health and Safety Code (§39655, subd. [a].) defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the Federal Clean Air Act (CAA) (42 USC Sec. 7412[b]) is a toxic air contaminant. Under State law, the California Environmental Protection Agency (CalEPA), acting through CARB, 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 one in four people will contract cancer over their lifetime, or 250,000 in one million, from all causes, including diet, genetic factors, and lifestyle choices.

Noncancer Health Risks. Unlike carcinogens, it is believed that there is a threshold level of exposure to most noncarcinogens below which they will not pose a health risk. CalEPA and the California Office of Environmental Health Hazard Assessment (OEHHA) 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 (HI).

2.4 Regulatory Setting

Air quality is defined by ambient air concentrations of specific pollutants identified by the USEPA to be of concern with respect to health and welfare of the general public. The USEPA is responsible for enforcing the Federal CAA of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several pollutants (called "criteria" pollutants, specifically, ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere. Table 1, *Ambient Air Quality Standards,* shows the federal and state ambient air quality standards.

Table 1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone	1-Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.070 ppm (137 $\mu g/m^3$)		0.075 ppm (147 $\mu g/m^3$)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		-		
Fine Particulate Matter ($PM_{2.5}$)[8]	24-Hour	-	-	35 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	12 $\mu g/m^3$		
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)[9]	1-Hour	0.18 ppm (339 $\mu g/m^3$)	Gas Phase Chemiluminescence	0.100 ppm (188 $\mu g/m^3$)	-	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)		0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1-Hour	0.25 ppm (655 $\mu g/m^3$)	Ultraviolet Fluorescence	75 ppb (196 $\mu g/m^{3)}$	-	Ultraviolet Fluorescence; Spectro-photometry (Pararo-saniline Method
	3-Hour	-		-	0.5 ppm (1300 $\mu g/m^3$)	
	24-Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (365 $\mu g/m^3$) (for certain areas)[9]	-	
	Annual Arithmetic Mean	-		0.030 ppm (80 $\mu g/m^3$) (for certain areas)[9]	-	
Lead[11,12]	30-Day Average	1.5 $\mu g/m^3$	Atomic Absorption	-	-	-
	Calendar Quarter	-		1.5 $\mu g/m^3$	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	-		0.15 $\mu g/m^3$		
Visibility Reducing Particles[13]	8-Hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	**No Federal Standards**		
Sulfates	24-Hour	25 $\mu g/m^3$	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24-Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chromatography			

Notes for Table 1:

1 California standards for ozone, carbon monoxide (except 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 eight-hour concentration in a year, averaged over three 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 $\mu g/m^3$ 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 three years, are equal to or less than the standard. Contact USEPA for further clarification and current federal 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 USEPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the USEPA.

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

9 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 parts per billion (ppb). California standards are in units of parts per million (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 standards of 53 ppb and 100 ppb are identical to 0.053 and 0.100 ppm, respectively.

10 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-hour 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 one 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 have are approved.

11 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.

12 The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one 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.

13 In 1989, the ARB converted both the general statewide 10-mile visibility standards and the Lake Tahoe 20-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.

Source: CARB June 4, 2013
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The CARB has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988 (CCAA), and also has established CAAQS for additional pollutants, including sulfates, H_2S, vinyl chloride and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be “nonattainment areas” for that pollutant. On April 30, 2012, the SDAB was classified as a marginal nonattainment area for the 8-hour NAAQS for ozone (CARB 2015). The SDAB is an attainment area for the NAAQS for all other criteria pollutants. The SDAB currently falls under a national “maintenance plan” for CO, following a 1998 redesignation as a CO attainment area (SDAPCD 2010). The SDAB is currently classified as a nonattainment area under the CAAQS for ozone (serious nonattainment), PM_{10}, and $PM_{2.5}$ (CARB 2016b).

The CARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The SDAPCD is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County.

The SDAPCD and San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The SDAPCD 2016 Revisions to the RAQS was adopted by the SDAPCD Board in December 2016. The local RAQS, in combination with those from all other California nonattainment areas with serious (or worse) air quality problems, is submitted to the CARB, which develops the California State Implementation Plan (SIP).

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and by the County as part of the development of the County's General Plan.

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin.

The current federal and state attainment status (Table 2, *Federal and State Air Quality Designation*) for San Diego County is as follows:

Table 2
FEDERAL AND STATE AIR QUALITY DESIGNATION

Criteria Pollutant	Federal Designation	State Designation
O_3 (1-hour)	(No federal standard)	Nonattainment
O_3 (8-hour)	Nonattainment	Nonattainment
CO	Maintenance	Attainment
PM_{10}	Unclassifiable	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(No federal standard)	Attainment
Hydrogen Sulfide	(No federal standard)	Unclassifiable
Visibility	(No federal standard)	Unclassifiable

Source: CARB 2016b and USEPA 2013

2.5 Background Air Quality

The SDAPCD operates a network of ambient air monitoring stations throughout the County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring station to the Project site is the Escondido East Valley Parkway Monitoring Station located at 600 East Valley Parkway in Escondido. Air quality data for this monitoring station is shown on Table 3, *Air Quality Monitoring Data.*

Because the Escondido East Valley Parkway monitoring station is located in an area where there is substantial traffic congestion, it is likely that pollutant concentrations measured at this monitoring station are higher than concentrations that would be observed or measured in the Project area, and would thus provide a conservative estimate of background ambient air quality. In particular, concentrations of CO at the Escondido monitoring station tend to be among the highest in the SDAB due to the fact that the monitor is located along East Valley Parkway in a congested area in downtown Escondido. The station sees higher concentrations of CO than have historically been measured elsewhere in San Diego County, and the background data are not likely to be representative of background ambient CO concentrations at the Project site due to the site's location in a less developed area.

Monitoring data at Escondido East Valley Parkway Monitoring Station have had acceptable levels of criteria air pollutants CO and NO_2 for the years 2013 to 2015. A violation of the state 1-hour standard for ozone occurred in 2014. Violations of the state 8-hour standards for ozone have occurred multiple times in 2013, 2014, and 2015, but only occurred for the federal standards in 2014. No state or federal violations of the daily PM_{10} standard occurred during 2014 and 2015; however, the state maximum daily standard was exceeded once in 2013. The federal daily $PM_{2.5}$ was exceeded once in both 2013 and 2014. The only annual average exceedances were the state PM_{10} standards in 2013 and 2014.

Table 3
AIR QUALITY MONITORING DATA

Air Pollutant	2013	2014	2015
Ozone			
Max 1-hour (ppm)	0.084	0.099	0.079
Days > CAAQS (0.09 ppm)	0	1	0
Max 8-hour (ppm)	0.075	0.080	0.071
Days > NAAQS (0.075 ppm)	0	5	0
Days > CAAQS (0.070 ppm)	4	8	3
Particulate Matter (PM_{10})			
Max Daily (μg/m^3)	82.0	44.0	31.0
Days > NAAQS (150 μg/m^3)	0	0	0
Days > CAAQS (50 μg/m^3)	1	0	0
Annual Average (μg/m^3)	23.2	21.6	17.5
Exceed CAAQS (20 μg/m^3)	Yes	Yes	No

Table 3 (cont.) AIR QUALITY MONITORING DATA			
Air Pollutant	**2013**	**2014**	**2015**
Particulate Matter ($PM_{2.5}$)			
Max Daily (µg/m^3)	56.3	77.5	29.4
Days > NAAQS (35 µg/m^3)	1	1	0
Annual Average (µg/m^3)	10.5	9.6	No Data
Exceed NAAQS (15 µg/m^3)	No	No	-
Exceed CAAQS (12 µg/m^3)	No	No	-
Nitrogen Dioxide (NO_2)			
Max 1-hour (ppm)	0.061	0.063	0.048
Days > NAAQS (0.10 ppm)	0	0	0
Days > CAAQS (0.18 ppm)	0	0	0
Annual Average (ppm)	0.013	0.011	No Data
Exceed NAAQS (0.053 ppm)	No	No	-
Exceed CAAQS (0.030 ppm)	No	No	-
Carbon Monoxide (CO)			
Max 8-hour (ppm)	2.3	1.9	1.9
Days > NAAQS (9.0 ppm)	0	0	0
Days > CAAQS (9.0 ppm)	0	0	0
Max 1-hour (ppm)	3.2	3.5	3.1
Days > NAAQS (35 ppm)	0	0	0
Days > CAAQS (20 ppm)	0	0	0

Sources: CARB 2016a (www.arb.ca.gov) (The Escondido-E Valley Parkway Monitoring Station was used for all pollutants except CO)
USEPA 2016 (http://www.epa.gov/airdata/ad_rep_con.html) (Used for CO)
Notes: > = exceeding; ppm = parts per million; µg/m^3 = micrograms per cubic meter;
Standard Mean = Annual Arithmetic Mean; No Data = Insufficient data available to determine the value.

3.0 SIGNIFICANCE CRITERIA AND ANALYSIS METHODOLOGIES

3.1 Significance Criteria

The County (2007) has approved guidelines for determining significance based on Appendix G.III of the State California Environmental Quality Act (CEQA) Guidelines, which provide guidance that a project would have a significant environmental impact if it would:

1. Conflict with or obstruct the implementation of the San Diego RAQS or applicable portions of the SIP;

2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;

3. Result in a cumulatively considerable net increase for which the SDAB is in non-attainment of NAAQS or CAAQS;

4. Expose sensitive receptors (including, but not limited to, residences, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; and

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

To determine whether a project would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation, or (b) result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for ozone precursors, oxides of NO_X and VOCs, project emissions may be evaluated based on the quantitative emission thresholds established by the SDAPCD. As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIAs). The County has also adopted the SCAQMD's screening threshold of 55 pounds per day or 10 tons per year as a significance threshold for $PM_{2.5}$.

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would not result in a significant impact to air quality. The screening thresholds are included in Table 4, *Screening-level Thresholds for Air Quality Impact Analysis*.

Table 4
SCREENING-LEVEL THRESHOLDS FOR AIR QUALITY IMPACT ANALYSIS

Pollutant	Total Emissions		
Construction Emissions (Pounds per Day)			
Respirable Particulate Matter (PM_{10})	100		
Fine Particulate Matter ($PM_{2.5}$)	55		
Oxides of Nitrogen (NO_X)	250		
Oxides of Sulfur (SO_X)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOCs)	75		
Operational Emissions			
	Pounds per Hour	**Pounds per Day**	**Tons per Year**
Respirable Particulate Matter (PM_{10})	---	100	15
Fine Particulate Matter ($PM_{2.5}$)	---	55	10
Oxides of Nitrogen (NO_X)	25	250	40
Oxides of Sulfur (SO_X)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	---	3.2	0.6
Volatile Organic Compounds (VOC)	---	75	13.7
Toxic Air Contaminant Emissions			
Excess Cancer Risk	1 in 1 million 10 in 1 million with T-BACT		
Non-Cancer Hazard	1.0		

Source: SDACPD Rule 20.2 and Rule 1210.
T-BACT = Toxics Best Available Control Technology

3.2 Methodology

The air quality impact analysis contained in this report was prepared in accordance with the methodologies provided by the County as included in the *Guidelines for Determining Significance and Report Format and Content Requirements for Air Quality* (County 2007).

Criteria pollutant and ozone precursor emissions from Project construction and operation are assessed using the California Emission Estimator Model (CalEEMod), Version 2013.2.2 (SCAQMD 2013). CalEEMod is a computer model developed by SCAQMD with the input of several air quality management and pollution control districts to estimate criteria air pollutant emissions from various urban land uses (SCAQMD 2013). CalEEMod has the ability to calculate both mobile (i.e., vehicular) and some area source or stationary sources of emissions. CalEEMod allows land use selections that include project land use types, sizes, and metric specifics.

The Project layout is shown on Figure 4, *Site Plan*. The "commercial" portion of the Project would include 5,000 square feet of small retail. The land use subtype used in the model for the retail portion of the Project was assumed to be retail – strip mall. This is considered to be a very conservative (worst-case) assumption as it represents a general neighborhood commercial land use that may attract trips as opposed to being a "pass-by" facility.

The Road Construction Emissions Model (Roadway Model) Version 7.1.5.1, developed by Sacramento Metropolitan Air Quality Management District (SMAQMD), was used in addition to CalEEMod due to the size of the proposed roadways. The Roadway Model is typically used for linear roadway-type construction projects (SMAQMD 2013) and may be used in conjunction with CalEEMod. Table 5, *Project Component Assumptions*, presents a summary of the land use data input values for CalEEMod and the Roadway Model.

Table 5
PROJECT COMPONENT ASSUMPTIONS

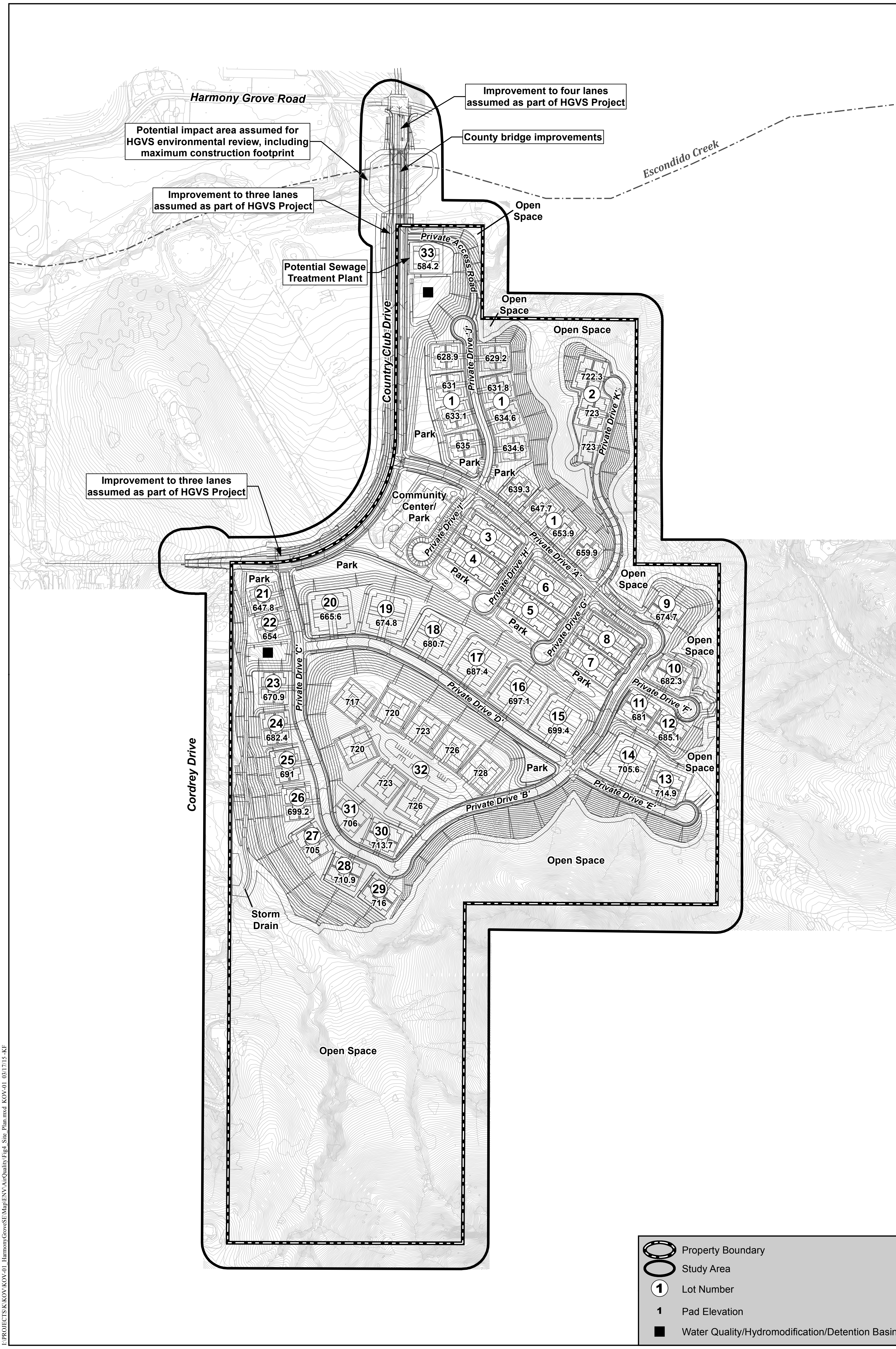
Land Use Type	Land Use Subtype	Size	Metric
Residential	Single Family Housing	193	Dwelling Unit
Residential	Multi-Family Housing	260	Dwelling Unit
Retail	Strip Mall	5	1,000 square feet
Roadway	New Road Construction	2.2	Miles
Parking	Center House Parking Lot	46	Spaces
Recreational	City Park	1.5	Acres

Construction Emissions. CalEEMod and the Roadway Model incorporate CARB's EMFAC2011 model for on-road vehicle emissions and the OFFROAD2011 model for off-road vehicle emissions (CARB 2012 and 2011). CalEEMod is designed to model construction emissions for land development projects while the Roadway Model is designed to model construction emissions for new or expanded roadway projects. Both models allow for the input of project-specific information, such as the number of equipment, hours of operations, duration of construction activities, and selection of emission control measures. The analysis assessed maximum daily emissions from individual construction activities, including site preparation, grading, backbone infrastructure, building construction, paving, and architectural coating. These are conservative assumptions, as they assume Project implementation of a bridge crossing of Escondido Creek, as well as upgrading Country Club Drive south of Harmony Grove Road with an additional travel lane.

Construction would require heavy equipment during mass grading, utility installations, building construction, and paving. Construction equipment estimates are based on default values in the Roadway Model and CalEEMod, as well as typical equipment used for the backbone infrastructure phase. Table 6, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each stage of construction.

Table 6
CONSTRUCTION EQUIPMENT ASSUMPTIONS

Construction Phase	Equipment	Number
Site Prep and Blasting	Rubber Tired Dozers	3
	Tractors/Loaders/Backhoes	4
	Crushing/Proc. Equipment	1
Backbone Infrastructure	Forklift	1
	Off-Highway Truck	2
	Other Material Handling Equipment	1
	Tractors/Loaders/Backhoes	1
	Trenchers	1
Road Construction	Crawler Tractor	1
	Excavators	3
	Grader	1
	Roller	2
	Rubber Tired Loaders	1
	Scrapers	2
	Signal Boards	4
	Tractors/Loaders/Backhoes	2
Grading	Excavators	2
	Graders	1
	Rubber Tired Dozers	1
	Scrapers	2
	Tractors/Loaders/Backhoes	2
Bridge Construction	Cranes	2
	Forklift	1
	Tractors/Loaders/Backhoes	3
	Pumps	1
	Generators	2
Building Construction	Cranes	1
	Forklifts	3
	Generator sets	1
	Tractors/Loaders/Backhoes	3
	Welders	1



Site Plan

HARMONY GROVE VILLAGE SOUTH

HELIX Environmental Planning

0 350 Feet

Figure 4

Table 6 (cont.) CONSTRUCTION EQUIPMENT ASSUMPTIONS		
Construction Phase	**Equipment**	**Number**
Parking Lot Paving	Pavers	2
	Paving Equipment	2
	Rollers	2
Architectural Coating	Air Compressors	1

Source: CalEEMod and Roadway Model (output data, including equipment horsepower, is provided in Appendix A).

Note: All equipment was assumed to operate 8 hours a day, with the exception of cranes and tractors/ loaders/backhoes (7 hours per day) and air compressors (6 hours per day).

The construction schedule was determined by using CalEEMod defaults, input from the Project Applicant, and standard assumptions for similarly sized projects, taking into consideration the size of the Project in order to estimate necessary construction activities and length of days per construction activity. For example, a backbone infrastructure phase was added to the model to account for necessary Project trenching and utility installation. Roadway construction would occur during backbone infrastructure activity. As shown in Table 7, *Modeled Construction Schedule*, for the purposes of modeling Project development was assumed to start in July of 2018 and is projected to end in 2021, with some construction activities occurring sequentially (site preparation, backbone infrastructure, grading, building construction) and some simultaneously (backbone infrastructure and road construction; grading and bridge construction; bridge construction and building construction; paving, building construction and architectural coating). The quantity, duration, and the intensity of construction activity have an effect on the amount of construction emissions and their related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner-burning construction equipment fleet mix than incorporated in the CalEEMod, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval). A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

Table 7 MODELED CONSTRUCTION SCHEDULE			
Construction Activity	**Construction Period**		
	Start	**End**	**Number of Working Days**
Site Preparation and Blasting	07/01/2018	09/30/2018	65
Backbone Infrastructure	10/01/2018	03/31/2019	130
Road Construction	10/01/2018	03/31/2019	130
Grading	04/01/2019	06/30/2019	65
Bridge Construction	04/01/2019	03/31/2020	260
Building Construction	07/01/2019	09/30/2021	588
Parking Lot Paving	05/01/2021	09/30/2021	109
Architectural Coating	05/01/2021	09/30/2021	109

Source: CalEEMod (output data is provided in Appendix A)

Although it was assumed that all of the dust control measures listed in Section 1.3 of this report would be implemented, to model the most conservative construction estimates, only application of water during grading and a 15-mph speed limit on unpaved surfaces was taken into consideration. Based on CalEEMod, Version 2013.2.2, the control efficiency for watering two times daily is 55 percent. The Project proposes balanced grading activity, which means that no soil would be transported off site for disposal nor would soil be transported on site for use in construction activities.

The Project would have to conform to the VOC limits included in SDAPCD Rule 67. According to Rule 67, residential interior coatings must have a VOC content less than or equal to 50 grams per liter (g/L), residential exterior coatings must have a content less than or equal to 100 g/L, and non-residential exterior and interior coatings must have a content less than or equal to 250 g/L. For modeling the Project's emissions in CalEEMod, conformance with these rules was assumed; however, non-residential coatings were assumed to be lower in VOC content than what is required (i.e., coatings with a VOC content less than or equal to 100 g/l). The quantities of coatings that would be applied to the interior and exterior of the new buildings were estimated according to CalEEMod default assumptions. A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

Blasting may be required at the site during initial site preparation and grading activity. Blasting operations would be conducted through the use of drilling and blasting to fracture rocks. At this time the exact amount of blasting has not been determined, however, it is assumed that approximately two to three blasting events may occur each week. Blasting operations would be conducted by a licensed blasting contractor, in strict compliance with pertinent federal, state, and County requirements. All blasting materials would be transported to the site for each blasting sequence and no explosives would be stored at the site. A single drill rig would be used to drill a pattern of boreholes each with a 3- to 6-inch diameter. Several holes are drilled in an approximately 22,500 square-foot-area. Typically, the pattern is laid out in a 10-by-10 to 20-by-20-foot grid, with up to approximately 25-foot-deep holes. A contractor then loads the holes with carefully metered explosives. The "shot" is timed to detonate each hole(s) in sequence. This minimizes the ground vibration and noise of the blast, while maximizing fracture of the rock. Some dust is created as a result of the blast. However, the dust would be fully dissipated within 30 to 60 seconds following the shot. The rock would be broken up to sizes less than 18 inches in diameter.

Following blasting, the rock resource would be fractured and can be moved with conventional earthmoving equipment. A front-end loader would be used to spread the fractured rocks around the site for balanced cut/fill grading.

Fugitive dust emissions associated with blasting can be estimated based on the USEPA's emission factor for blasting for coal mining to remove overburden, which is a similar process. According to Section 11.9 of AP-42, emissions from blasting would be calculated as follows:

> Pounds (lbs) PM_{10}/blast = $0.000014(A)^{1.5}$ x 0.52 lbs PM_{10}/lbs total suspended particulates (TSP)
>
> Where:
>
> A is the area of blasting, which is approximately 22,500 square feet.

The Project would utilize ammonium nitrate/fuel oil (ANFO) explosives to conduct blasting on site. Based on the USEPA's AP-42 Section 13.3 emission factors, emissions from use of ANFO are estimated at 67 lbs CO per ton of explosive, and 17 lbs NO_X per ton of explosive. Based on typical construction projects, it was estimated that a maximum of 2,500 lbs/day (or 1.25 tons per day) could be used at the site.

Operational Emissions. The model estimates Project-generated, long-term regional area-source and mobile-source emissions of criteria air pollutants and ozone precursors. Operational emissions from area sources include the combustion of natural gas for heating and hot water, engine emissions from landscape maintenance equipment, and VOC emissions from repainting of buildings. Residential units would only have natural gas fireplaces.

Operational emissions from mobile source emissions are associated with Project-related vehicle trip generation. Based on the Traffic Impact Analysis (TIA; LLG 2017), at full buildout the Project would generate approximately 4,500 average daily trips (ADT).

CalEEMod default motor vehicle emission rates are based on CARB's EMFAC state-wide emission factors for the San Diego County region which are incorporated into CalEEMod. Default vehicle speeds, trip purpose, and trip type percentages for single-family homes were used. Average mobile trip lengths of 7.88 miles per trip were obtained from the Traffic Study – Average Trip Length memorandum (LLG 2016). Model output data sheets are included in Appendix A.

Wastewater Treatment and Water Reclamation Facility. As described previously in Section 1.2, Project Location and Description, the Project design includes a new stand-alone on-site Aeromod WTWRF that would provide treatment for all wastewater generated on site, and would produce reclaimed effluent per applicable regulatory standards for irrigation of on-site landscaping. Based on the loading and design criteria used in the 180,000-gpd HGV plant design, new treatment processes with similar tank sizes would be constructed at HGV South. A summary of major plant components includes the:

- Equalization basin to balance out variations in flow by storing a portion of the peak flows received for treatment in the plant during low-flow periods, and incorporating the headworks to provide fine screening of the influent wastewater.

- Secondary treatment areas to include aeration basins and anoxic basins performing the activated sludge process along with biological nitrogen removal as well as clarifier basins to settle most of the solids out of the wastewater to yield a clarified flow that goes to filters for further turbidity removal

- Filters for further removal of turbidity to produce reclaimed water meeting Title 22 standards for effluent clarity.

- Chlorine contact basins for disinfection of the reclaimed water by chlorine solution.

- Residual solids processing. The Aero-Mod process typically includes digester basins for further reduction of the settled solids produced by the treatment process.

- Equipment building, also providing space for employees to store their personal items, restrooms and showers for employees, some desk space and a small laboratory for use in operational control of the plant would be constructed on site.

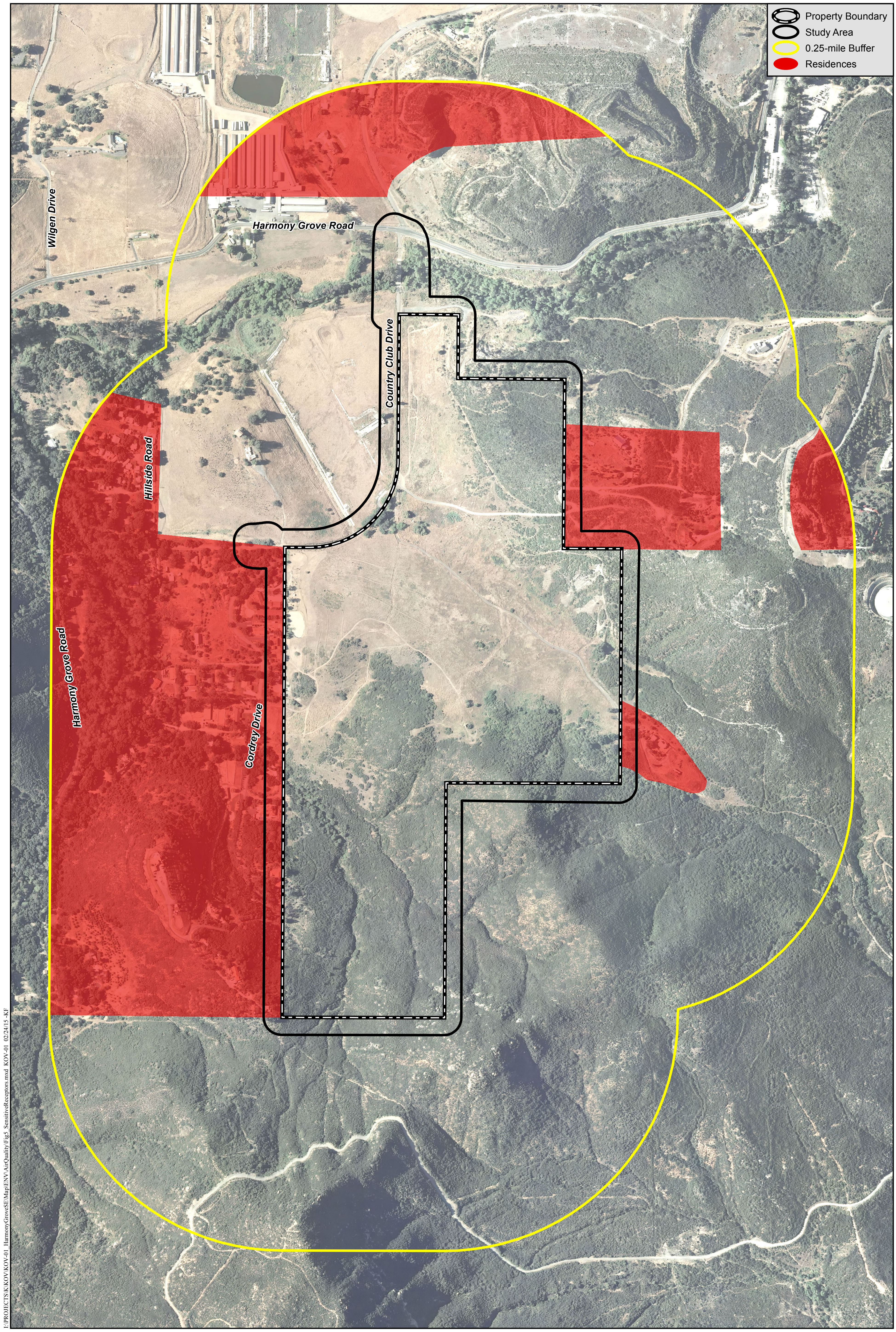
- Non-compliant effluent storage tanks.

Diesel-powered emergency generators would be used at the WTWRF for backup power during electric power failures. Generator emissions were estimated using CalEEMod. Emissions were calculated based on the annual testing frequency and duration and the power output of the engines. For the purposes of this analysis it was assumed that two 84 horsepower generators would operate for 8 hours per day, 260 days per year.

Location of Off-site Sensitive Receptors. Existing sensitive receptors within ¼ mile of the Project vicinity include scattered residences surrounding the Project vicinity in all directions with the highest density to the west. There are no hospitals or other non-residence sensitive receptors within ¼ mile of the Project site. Figure 5, *Location of Sensitive Receptors*, presents the location of sensitive receptors within ¼ mile of the Project site. As shown in Figure 5, the closest sensitive receptors include the residential uses to the west. The approved HGV project is currently under construction; consistent with the Project TIA, which assumes that project in place for traffic generation, residents are assumed to be present during the Proposed Project's initiation.

Carbon Monoxide Impacts at Congested Intersections. Localized CO concentrations at intersections that would result in a level of service (LOS) E or F due to the Project were estimated using the California Department of Transportation (Caltrans) California Line Source Dispersion Model (Version 4) (CALINE4) line source dispersion model. LOS is a measure of traffic delay, rated A-F, with F indicating the worst delay.

Health Risks from Diesel Particulate Matter and Volatile Organic Compounds. To evaluate whether Project construction activities and WTWRF could pose a significant impact to nearby



Location of Sensitive Receptors

HARMONY GROVE VILLAGE SOUTH

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0 500 Feet

Figure 5

sensitive receptors, a health risk evaluation of diesel particulate matter (DPM) and VOCs were conducted using the USEPA SCREEN3 model. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure, which is defined in the California Office of Environmental Health Hazard Assessment (OEHHA) guidelines, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, as 24 hours per day, 7 days per week, 365 days per year, for 70 years.

Diesel exhaust particulate matter would be emitted during construction due to the operation of heavy equipment at the site. TACs also would be generated during treatment of the influent at the WTWRF. Most TAC emissions would be produced during degradation or reaction while in the treatment system. Organic compounds would volatilize from the liquid surface of the reactors during the biological treatment of influent. The USEPA's approved air dispersion model, SCREEN3, was used to estimate the downwind impacts at the closest receptors to the construction sites and WTWRF. The model was run using worst-case meteorological conditions. Risks were estimated using the OEHHA unit risk factor for diesel PM and volatile compounds, which is an upper-bound cancer risk estimate based on 70 years of exposure. Because the unit risk factor is based on 70 years (25,550 days) of exposure for 24 hours per day, 365 days per year, the diesel PM results of the analysis were scaled down to four years to account for exposure for the duration of the total construction duration period. The chronic and acute results for the WTWRF are based on the annual and 24-hour average exposure periods. Further details relative to the health risk methodology are included in Appendix B.

4.0 PROJECT IMPACT ANALYSIS

The Project would result in both construction and operational emissions. Construction emissions include short-term emissions associated with mass grading, infrastructure installation, roadways, and structure development from the Project. Operational emissions include long-term emissions associated with the Project, including energy usage and traffic at full Project buildout.

4.1 Conformance to the Regional Air Quality Strategy

4.1.1 Guidelines for the Determination of Significance

The RAQS outlines SDAPCD's plans and control measures designed to attain the CAAQS for ozone. In addition, the SDAPCD relies on the SIP, which includes the SDAPCD's plans and control measures for attaining the ozone NAAQS. These plans accommodate emissions from all sources, including natural sources, through implementation of control measures, where feasible, on stationary sources to attain the standards. Mobile sources are regulated by the USEPA and the CARB, and the emissions and reduction strategies related to mobile sources are considered in the RAQS and SIP.

The RAQS relies on information from CARB and SANDAG, including projected growth in the County, mobile, area and all other source emissions in order to project future emissions and determine from that the strategies necessary for the reduction of stationary source emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and by the County. As such, projects that propose development that is consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project proposes development which is less dense than anticipated within the General Plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the County General Plan and SANDAG's growth projections upon which the RAQS is based, the project would be in conflict with the RAQS and SIP, and might have a potentially significant impact on air quality. This situation would warrant further analysis to determine if the Project and the surrounding projects exceed the growth projections used in the RAQS for the specific subregional area.

4.1.2 Significance of Impacts Prior to Mitigation

The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for ozone. The RAQS relies on SANDAG growth projections based on population, vehicle trends, and land use plans developed by the cities and by the County as part of the development of their general plans and specific plans.

Projects that propose development that is consistent with (or less dense than) the growth anticipated by the general plans would be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the County General Plan and SANDAG's growth projections upon with the RAQS is based, the project would be in conflict with the RAQS and SIP, and may have a potentially significant impact on air quality. This situation would warrant further analysis to determine if the Project and the surrounding projects exceed the growth projections used in the RAQS for the specific subregional area.

The 2016 RAQS (SDAPCD 2016) are based on projections for residential, commercial, industrial and recreational land uses contained in the current General Plan, adopted in 2011. The current Project involves a GPA and is proposing to increase the total number of residential units from 220 dwelling units, as allowed under the current 2011 General Plan Land Use Designation, to 453 dwelling units. Because the Project is proposing a more dense development than was planned in 2011, it correspondingly is also proposing an increase of units over that proposed in the RAQS.

As detailed in Section 4.2, below, the Project would not result in a significant air quality impact with regards to construction- and operational-related emissions of ozone precursors or criteria air pollutants. Therefore it is unlikely that the additional units from the Project would interfere with the SDAPCD's goals for improving air quality in the SDAB. Regardless, because the Project is proposing an increase in housing units beyond what was included for the site in the RAQS, consistent with the County guidelines, impacts associated with conformance to regional air quality plans would be potentially significant.

4.1.3 Mitigation Measures and Design Considerations

The General Plan Conservation and Open Space Element includes goals and policies designed to reduce emissions of criteria pollutants while protecting public health (County 2011). The Project's consistency with specific General Plan Conservation Element policies is analyzed in Table 8.

Table 8 COUNTY GENERAL PLAN POLICIES	
Policy	**Project Consistency**
COS14.3 Sustainable Development. Require design of residential subdivisions and nonresidential development through "green" and sustainable land development practices to conserve energy, water, open space, and natural resources.	*Consistent.* As discussed in Section 1.4 of this report, the Project includes many design features to reduce energy and water use.
COS14.7 Alternative Energy Sources for Development Projects. Encourage development projects that use energy recovery, photovoltaic, and wind energy.	*Consistent.* The Project proposes to supply 100 percent of Project's electricity needs through renewable sources.
COS15.1 Design and Construction of New Buildings. Require that new buildings be designed and constructed in accordance with "green building" programs that incorporate techniques and materials that maximize energy efficiency, incorporate the use of sustainable resources and recycled materials, and reduce emissions of greenhouse gases (GHGs) and toxic air contaminants (TACs).	*Consistent.* The Project proposes sustainability and efficiency features consistent with the CALGreen Building Code. The Project proposes to supply 100 percent of electricity needs through renewable sources. The Project proposes implementing energy efficiency features that would achieve 2016 Title 24 requirements.
COS15.4 Title 24 Energy Standards. Require development to minimize energy impacts from new buildings in accordance with or exceeding Title 24 energy standards.	*Consistent.* The Project proposes implementing energy efficiency features that would meet 2016 Title 24 standards, which are more efficient than the 2008 Title 24 requirements that were current when the General Plan was adopted, and will be eligible for the County's Green Building Incentive Program.
COS17.2 Construction and Demolition Waste. Require recycling, reduction and reuse of construction and demolition debris.	*Consistent.* The Project would prepare a Construction Debris Management Plan that complies with Section 68.508-68.518 of the County Municipal Code, and would divert 90 percent of inert construction materials and 70 percent of all other construction materials from landfills through reuse and recycling.
COS17.6 Recycling Containers. Require that all new land development projects include space for recycling containers.	*Consistent.* The Project would provide areas for storage and collection of recyclables and yard waste.
COS19.1 Sustainable Development Practices. Require land development, building design, landscaping, and operational practices that minimize water consumption.	*Consistent.* The Project proposes implementing water conservation strategies to reduce water usage by installing low-flow water features.

The CalEEMod modeling analysis was conducted using a conservative approach and the Project would include features such as a variety of energy-efficient building materials, solar roofs, solar ready roofs, and energy star appliances.

Mitigation for inconsistencies with the RAQS would be as follows:

M-AQ-1 The County shall provide a revised housing forecast to SANDAG to ensure that any revisions to the population and employment projections used by the SDAPCD in updating the RAQS and SIP will accurately reflect anticipated growth due to the Proposed Project.

4.1.4 Conclusions

The Proposed Project would not conform with the RAQS and SIP and would result in a significant and unavoidable impact. These significant impacts will be reduced to less than significant when the RAQs are updated. M-AQ-1 requires that the County provide a revised housing forecast to SANDAG to ensure that any revisions to the population and employment projects are considered. The provision of housing information would assist SANDAG in revising the housing forecast; however, until the anticipated growth is included in the emission estimates of the RAQS and the SIP, the direct and cumulative impacts would remain significant and unavoidable.

4.2 Conformance to Federal and State Ambient Air Quality Standards

4.2.1 Construction Impacts

4.2.1.1 *Guidelines for the Determination of Significance*

Would the project construction result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation?

To determine whether a project would result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation, project emissions may be evaluated based on the quantitative emission thresholds established by the SDAPCD (as shown in Table 1). These limits are as follows:

Ozone Precursors

Would the project result in emissions that exceed 250 pounds per day of NO_X, or 75 pounds per day of VOCs?

Carbon Monoxide

Would the project result in emissions that exceed 550 pounds per day of CO, and when totaled with the ambient concentrations exceed a 1-hour concentration of 20 ppm or an 8-hour average of 9 ppm?

Particulate Matter

Would the project result in emissions of $PM_{2.5}$ that exceed 55 pounds per day?

Would the project result in emissions of PM_{10} that exceed 100 pounds per day and increase the ambient PM_{10} concentration by 5.0 $\mu g/m^3$ or greater at any sensitive receptor locations (or maximum exposed individual (MEI), a term commonly used by CARB for sensitive receptors)?

4.2.1.2 *Significance of Impacts Prior to Mitigation*

The construction activities associated with the Project would create diesel emissions, and would generate emissions from dust. In general, emissions from diesel-powered equipment contain more NO_X, SO_X, and particulate matter than gasoline-powered engines. However, diesel-powered engines generally produce less CO and less reactive organic gases than do gasoline-powered engines.

Emissions related to the construction of the Project would be temporary. Table 9, *Estimated Construction Emissions,* provides a summary of the daily construction emission estimates by construction activity. As noted above, it was assumed that dust control measures (watering a minimum of two times daily) would be employed to reduce emissions of fugitive dust during site grading. Where construction activities were assumed to occur simultaneously, the resultant emissions from each activity were summed and compared to the daily emission thresholds to determine significance.

Table 9
ESTIMATED CONSTRUCTION EMISSIONS

Construction Activity	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	lbs/day					
Site Preparation and Blasting	5	71	125	3	52	11
Backbone Infrastructure	3	29	19	<0.5	2	1
Road Construction	6	72	49	<0.5	13	5
Grading	5	54	41	<0.5	7	4
Bridge Construction	4	35	40	<0.5	5	2
Building Construction	4	26	35	<0.5	4	2
Parking Lot Paving	1	13	15	<0.5	1	1
Architectural Coating	50	2	4	<0.5	1	<0.5
Maximum Daily Emissions	**54**	**100**	**125**	**3**	**52**	**11**
Screening-Level Thresholds	**75**	**250**	**550**	**250**	**100**	**55**
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
1. Fugitive dust measures (watering twice daily) were applied to control PM_{10} and $PM_{2.5}$ dust emissions.
2. Includes use of low-volatile organic compound (VOC) coatings.
3. Maximum daily VOC emissions occur from May 2021 through September 2021 when Building Construction, Paving, and Architectural Coatings overlap.
4. Maximum daily NO_X emissions occur from October 2018 through March 2019 when Backbone Infrastructure and Road Construction overlap.
5. Maximum daily CO, SO_2, PM_{10}, and $PM_{2.5}$ emissions occur from July 2018 through September 2018 during Site Preparation and Blasting.

As shown in Table 9, with implementation of construction BMPs and Project design features, emissions of all criteria pollutants, including PM_{10} and $PM_{2.5}$, would be below the daily thresholds during construction. Construction of the Project would, therefore, not conflict with the NAAQS or CAAQS, and would have less than significant impacts.

4.2.1.3 *Mitigation Measures and Design Considerations*

As discussed in Section 1.3, the Project would incorporate construction BMPs and Project design features in an effort to reduce Project-related emissions. With implementation of those measures, the Project would not exceed the significance thresholds established by the County; therefore, impacts would be less than significant and no mitigation is required.

4.2.1.4 *Conclusions*

With implementation of the design considerations noted above, the Proposed Project would result in construction-related emissions below the level of significance. Therefore, Project criteria pollutants emissions during construction would constitute a less than significant impact on the ambient air quality.

4.2.2 Operational Impacts

4.2.2.1 *Guidelines for the Determination of Significance*

Based on the County Guidelines (2007), operational impacts would be potentially significant if they exceed the quantitative screening-level thresholds for criteria pollutants as listed under Section 4.2.1.1.

4.2.2.2 *Significance of Impacts Prior to Mitigation*

The main operational emissions sources associated with the Project are associated with traffic; emissions associated with area sources such as energy use, landscaping, and the use of fireplaces at the residences also would be generated.

Project-generated traffic was addressed in the TIA (LLG 2017). Based on the TIA, at full buildout the Project would generate approximately 4,500 ADT. To estimate emissions associated with Project-generated traffic, the CalEEMod model was used. Motor vehicle emission rates are, therefore, based on CARB's EMFAC state-wide emission factors for the San Diego County region. Emission factors representing the vehicle mix for emission analysis year 2021 were used to estimate emissions. Default vehicle speeds, trip purpose, and trip type percentages for single-family homes were used. Trip lengths were obtained from the Traffic Study – Average Trip Length memorandum (LLG 2016).

Generator emissions were estimated using CalEEMod. Emissions were calculated based on the annual testing frequency and duration and the power output of the engines.

Area source emissions, including emissions from energy use, natural gas fireplaces, landscaping, and maintenance use of architectural coatings were calculated using the CalEEMod model. Operational emission calculations and model outputs are provided in Appendix A.

Table 10, *Operational Emissions,* presents the summary of operational emissions for the Project, which include operational emissions from off-road equipment (i.e., generators associated with the WTWRF). As shown in Table 10, project emissions of all criteria pollutants during operation would be below the daily thresholds. Therefore, operation of the Project would not be considered a significant impact on air quality. Impacts would be less than significant.

Table 10
OPERATIONAL EMISSIONS

Category	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	lbs/day					
Area	18	<0.5	38	<0.5	1	1
Energy	<0.5	1	1	<0.5	<0.5	<0.5
Mobile	13	24	124	<0.5	24	7
WTWRF Generators	1	7	7	<0.5	<0.5	<0.5
TOTAL	**32**	**32**	**169**	**<0.5**	**25**	**8**
Screening-Level Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Concurrent Construction and Operations

Due to the anticipated phasing, it is possible that occupation of up to half of the dwelling units may occur concurrently with the later construction phases of the remaining units. Table 11, *Concurrent Operational and Construction Emissions*, shows the worst-case daily emissions from this potential overlap.

Table 11
CONCURRENT OPERATIONAL AND CONSTRUCTION EMISSIONS

Category	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	lbs/day					
Construction[a]	54	36	51	<0.5	5	3
Operation[b]	16	16	85	<0.5	13	4
TOTAL[c]	**71**	**52**	**135**	**<0.5**	**18**	**6**
Screening-Level Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

[a] Maximum daily construction emissions that may overlap with operations occur from May through September 2021 when Building Construction, Paving, and Architectural Coating phases overlap.
[b] Total for Peak Daily Operational Emissions assumes half of the Project is built and is therefore half of the results reported in Table 10.
[c] Totals may not add due to rounding.

The combined construction and operational emissions would be below the significance threshold for all criteria pollutants. The CalEEMod model outputs are presented in Appendix A. As shown in Tables 10 and 11, emissions of criteria pollutants during operation of the Project whether or not there is an overlap with construction would not exceed the daily thresholds for any of the criteria pollutants. Therefore, no significant air quality impact is anticipated and mitigation measures are not required.

Wastewater Treatment and Water Reclamation Facility

As described previously in Section 1.2, Project Location and Description, the Project design includes an on-site WTWRF.

Criteria pollutant and TAC emissions would be generated during treatment of the influent at the WTWRF. Most air pollutant emissions would be produced during degradation or reaction while in the treatment system. Organic compounds would volatilize from the liquid surface of the reactors during the biological treatment of influent.

Emission factors and speciation for volatile compounds from influent treatment were obtained from the San Joaquin Valley Air Pollution Control District (SJVAPCD) (1993), as the SDAPCD does not have this information readily available. These are general emission factors expressed in terms of pounds of pollutant emissions per million gallons per day (mgd) of influent. These factors were used to estimate daily emissions of various TACs typically contained in influent waste streams. Emissions of TACs from treatment were estimated for full buildout influent throughput of 0.18 mgd.

A screening-level health risk assessment was performed using the USEPA SCREEN3 model. SCREEN3 uses worst-case meteorological conditions to conservatively estimate ground-level pollutant concentrations downwind of the source. The SCREEN3 results were combined with unit risk factors and reference exposure levels obtained from the OEHHA to evaluate cancer, chronic non-cancer, and acute health risk (OEHHA 2003). The modeled cancer, chronic non-cancer, and acute non-cancer risks were modeled for each individual compound and the results added to produce a conservative estimate of risk from all compounds. Table 12, *Parameters Used in SCREEN3 Dispersion Modeling*, summarizes the parameters used in the SCREEN3 modeling.

Table 12
PARAMETERS USED IN SCREEN3 DISPERSION MODELING

Modeling Parameter	Values Used in Model
Emission rate	1 gram per second
1-hour average to annual average persistence factor	0.1
Stack height	12.8 meters (42 feet)
Stack diameter	0.91 meter (3 feet)
Stack exit velocity	3.66 meters per second (10 feet per second)
Stack gas exit temperature	294.3 Kelvin
Land use	Rural

Aqueous hypochlorite would be stored on site and used for the chlorination process. There would be potential for accidental release of such a substance. However, the facility staff would follow the administrative and engineering requirements of the California Accidental Release Prevention Program. The California Accidental Release Prevention Program's main objective is to prevent accidental releases of regulated substances determined to potentially pose the greatest risk of immediate harm to the public and the environment. The planning activities required by the program are intended to minimize the possibility of an accidental release by encouraging engineering and administrative controls (USEPA 2014). It is further intended to mitigate the effects of an accidental release, by requiring owners or operators of facilities to develop and implement an accident prevention program. Any accidental release of this substance would be contained on site with no offsite runoff, and handlers would be trained in spill reaction. As such, there would be no impact resulting from the storage of this compound at the facility.

TAC emissions from the WTWRF would be produced during reaction or degradation while in the treatment system. Compounds would volatilize from the liquid surface of the reactors during the biological treatment of influent. Total TAC emissions are summarized in Table 13, *Estimated TAC Emissions from WTWRF*.

Table 13
ESTIMATED TAC EMISSIONS FROM WTWRF

Compound	Peak Daily Emissions (lbs/day)
Ammonia	4.498E-05
Benzene	8.712E-08
Chloroform	1.217E-06
Ethyl Benzene	3.379E-07
Hydrogen Sulfide	2.929E-06
1,1,1-TCA	3.980E-07
Methylene Chlorine	1.172E-06
1,4-Dichlorobenzene	6.984E-07
Phenol	1.472E-06
Styrene	7.510E-07
Toluene	7.360E-07
TCE	3.905E-07
Xylene	8.802E-07
TOTAL VOC EMISSION	**5.605E-05 (or 0.00005605)**
Screening-Level Thresholds	75
Exceedance?	No

Specific information about emission controls as part of the facility's design is not currently known. Therefore, the results of the analysis presented above represent uncontrolled emissions. However, it is likely that common control technologies would be implemented to substantially reduce emissions. Tightly covered, well-maintained collection systems can suppress emissions by 95 to 99 measures (USEPA 1998). The types of control technology generally used in reducing TAC emissions from wastewater include steam or air stripping, carbon adsorption, chemical oxidation, membrane separation, liquid-liquid extraction, and biotreatment (aerobic or anaerobic) (USEPA 1998). As shown in Table 13, the total uncontrolled TAC emissions from operation of the WTWRF are below the SDAPCD thresholds of significance, resulting in a less than significant impact. The mass emissions, when combined with other operational emissions, would also be below the County's screening level thresholds.

Traffic Related CO Concentrations (CO Hot Spot Analysis)

Vehicle exhaust is the primary source of CO. In an urban setting the highest CO concentrations are generally found within close proximity to congested intersections. Under typical meteorological conditions, CO concentrations tend to decrease as distance from the emissions source (i.e., congested intersection) increase. Project-generated traffic has the potential of contributing to localized hot spots of CO off-site. A CO hot spot is a localized concentration of CO that is above the state or national 1-hour or 8-hour CO ambient air standards.

To verify that the Project would not cause or contribute to a violation of the 1-hour and 8-hour CO standards either on a project or cumulative level, an evaluation of the potential for CO hot spots at nearby intersections was conducted. The TIA (LLG 2017) evaluated whether or not there would be a decrease in the LOS at the intersections affected by the Proposed Project. The County guidelines call for a CO hotspot analysis if the Project would:

- place sensitive receptors within 500 feet of a signalized intersection with a level of service (LOS) of E or F, with peak-hour trips exceeding 3,000 vehicles; or

- cause intersections to operate at LOS E or F, with peak-hour trips exceeding 3,000 vehicles.

According to the TIA (LLG 2017), three intersections under the Existing Plus Project Plus Cumulative Projects would operate at LOS E or F and experience an increase in delay from the Project:

1. Valley Parkway / I-15 Northbound Ramps

2. Country Club Drive / Harmony Grove Road

3. Harmony Grove Road / Kauana Loa Drive

The Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998) requires the modeler to model the intersections that have worst LOS and the highest traffic volumes. If the selected intersections do not show an exceedance of the NAAQS, none of the other intersections will. Some intersections may fall into both the highest traffic volumes and worst LOS categories. As recommended in the Protocol, receptors were located at locations that were approximately 3 meters (10 feet) from the mixing zone, and at a height of 1.8 meters (6 feet). Emission factors from the EMFAC2011 model for the year 2020 at a temperature of 60 degrees Fahrenheit and 50 percent humidity were used in the CALINE4 model.

In accordance with the Protocol, it is also necessary to estimate future background CO concentrations in the Project vicinity to determine the potential impact plus background and evaluate the potential for CO hot spots due to the Project. The existing maximum 1-hour and 8-hour background concentrations of CO of 4.4 and 3.70 ppm were used to represent future maximum background 1-hour and 8-hour CO concentrations, as presented earlier in Table 3. CO concentrations in the future may be lower as inspection and maintenance programs and more stringent emission controls are placed on vehicles.

Modeled 1-hour CO concentrations were scaled to evaluate maximum predicted 8-hour CO concentrations using the recommended persistence scaling factor of 0.7 for urban locations. The CALINE4 model outputs are provided at the end of Appendix A of this report. Table 14, *CO Hot Spots Modeling Results,* presents a summary of the predicted CO concentrations (impact plus background) for the intersections evaluated for the Existing plus Project plus Cumulative Projects traffic for the affected intersections. As shown in Table 14, the predicted CO concentrations would be substantially below the 1-hour and 8-hour NAAQS and CAAQS for CO. Therefore, no exceedances of the CO standard are predicted, and the Project would not cause or contribute to a violation of the air quality standard. The Project would not result in a significant cumulative impact for CO.

Table 14
CO HOT SPOTS MODELING RESULTS

Intersection	Peak Period	Maximum 1-hour with Project Concentration	Maximum 8-hour with Project Concentration
Valley Parkway at I-15 Northbound Ramps	AM	5.9	4.75
	PM	5.9	4.75
Country Club Drive at Harmony Grove Road	AM	4.9	4.05
	PM	5.0	4.12
Harmony Grove Road at Kauana Loa Drive	AM	5.0	4.12
	PM	5.1	4.19
Ambient Air Quality Standard		*20*	*9.0*
Significant Impact?		*No*	*No*

Notes:
CALINE4 dispersion model output sheets and EMFAC2011 emission factors are provided at the end of Appendix A.
ppm = parts per million
Peak hour traffic volumes are based on the TIA prepared for the Project by LLG Engineers (2017).
Highest 3 years SDAPCD (2011-2013) 1-hour ambient background concentration (4.4 ppm) + 2020 modeled CO 1-hour contribution.
Highest 3 years SDAPCD 8-hour ambient background concentration (3.70 ppm) multiply by 1-hour/8-hour conversion factor of 0.7 and then add the 2020 modeled CO 8-hour contribution.

4.2.2.3 *Mitigation Measures and Design Considerations*

As listed in Section 1.3, a wide range of current regulatory codes, Project design features, and other measures would be incorporated into the Proposed Project. The Project would incorporate energy-efficiency features that would meet the 2016 California Title 24 Energy Efficiency Standards. The installation of natural gas fireplaces would prevent residences from using wood as fuel for fire and minimize the generation of particulate emissions in the area. Given the result of a less than significant impact, no additional mitigation measures would be required.

4.2.2.4 *Conclusions*

Operation emissions of criteria pollutants for the full Project buildout, and combined construction and operational emissions would be below the significance thresholds and, therefore, would be less than significant under CEQA.

4.3 Cumulatively Considerable Net Increase of Criteria Pollutants

4.3.1 Construction Impacts

Based on the County Guidelines (2007), a project would result in a cumulatively significant impact if the project results in a significant contribution to the cumulative increase in pollutants for which the SDAB is listed as nonattainment for the CAAQS and NAAQS. As discussed in Section 2.0, the SDAB is designated as a nonattainment area for the NAAQS for ozone and the CAAQS for ozone, PM_{10}, and $PM_{2.5}$.

Cumulatively considerable net increases during the construction phase would typically happen if two or more projects near each other are simultaneously constructing projects. A project that has a significant direct impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NO_X, or VOCs during construction would also have a significant cumulatively considerable net increase. In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions of concern from the proposed project, in combination with the emissions of concern from other proposed or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines identified in Section 3.0.

4.3.1.1 *Guidelines for the Determination of Significance*

The following thresholds are used for the assessment of cumulative construction impacts:

Would the project result in emissions that exceed 250 pounds per day of NO_X or 75 pounds per day of VOCs?

Would the project result in emissions of $PM_{2.5}$ that exceed 55 pounds per day?

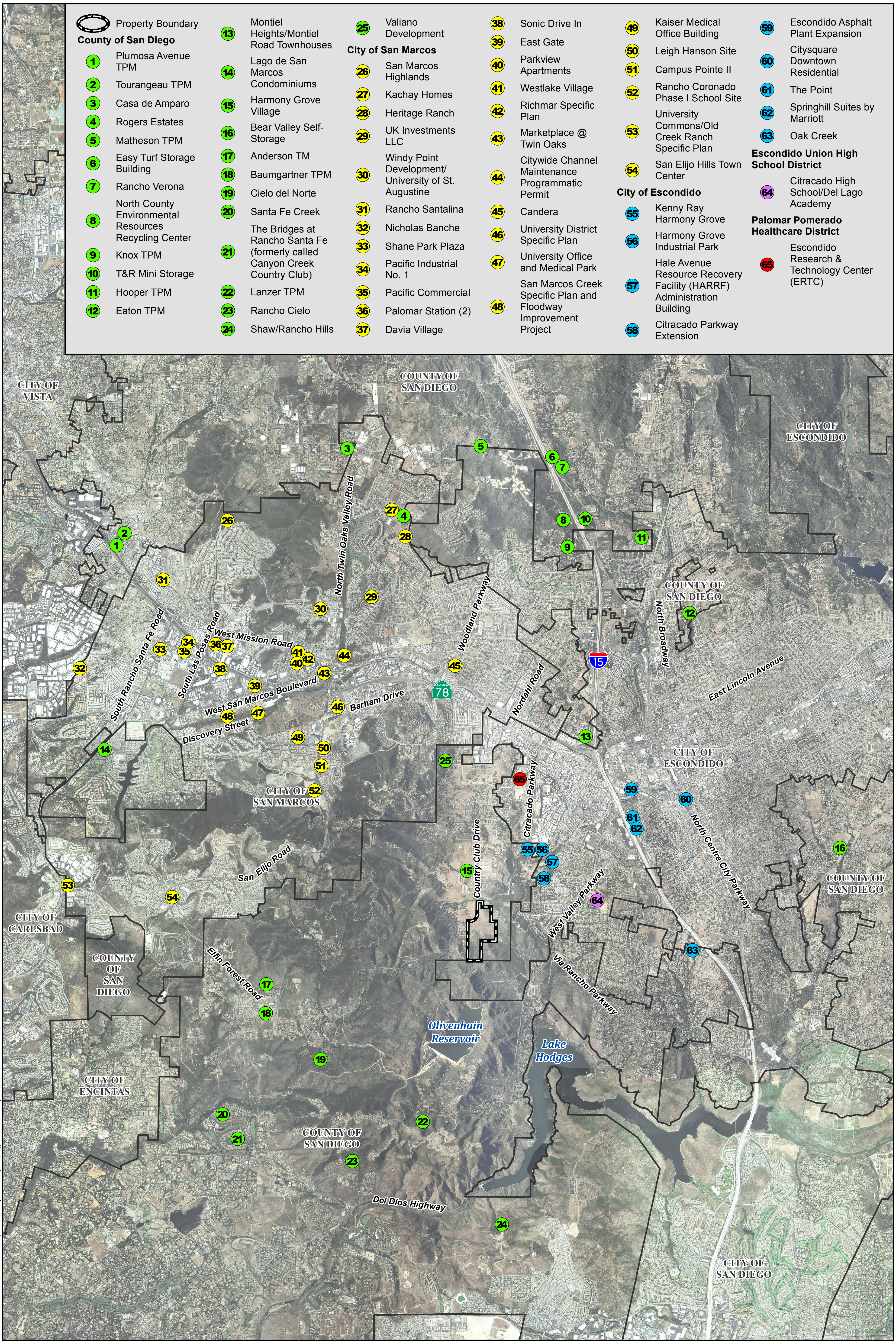
Would the project result in emissions of PM_{10} that exceed 100 pounds per day and increase the ambient PM_{10} concentration by 5 micrograms per cubic meter (5.0 $\mu g/m^3$) or greater at the maximum exposed individual?

4.3.1.2 *Significance of Impacts Prior to Mitigation*

There is a cumulative exceedance related to regional emissions of VOC, NO_X, PM_{10}, and $PM_{2.5.}$ The question therefore arises regarding whether the Project could result in a considerable contribution to this regional effect.

As discussed in *Section 4.2.1.4*, Project emissions of VOC, NO_X, PM_{10}, and $PM_{2.5}$ during construction would be below the screening-level thresholds and would result in a less than significant air quality impact. The locations of cumulative projects in relation to the HGV South development are presented in Figure 6, *Cumulative Projects*.

With regard to past and present projects, the background ambient air quality, as measured at the monitoring stations maintained and operated by the SDAPCD, measures the concentrations of pollutants from existing sources. Past and present project impacts are therefore included in the background ambient air quality data.



Cumulative Projects

HARMONY GROVE VILLAGE SOUTH

Figure 6

0 6,000 Feet

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Short-term emissions associated with construction generally result in near-field impacts. In particular, with respect to local impacts, the consideration of cumulative construction particulate (PM_{10} and $PM_{2.5}$) impacts is limited to cases when projects constructed simultaneously are within a few hundred yards of each other because of (1) the combination of the short range (distance) of particulate dispersion (especially when compared to gaseous pollutants); and (2) the SDAPCD's required dust-control measures, which further limit particulate dispersion from a project site. Based on the cumulative projects identified in Figure 6, there are no known projects within 1,500 feet of the proposed Project where major construction would occur concurrently with the project. As mentioned previously, the HGV Project is currently under construction. It is anticipated that all major grading activities would be completed prior to the commencement of HGV South construction. Therefore there would be no cumulative construction particulate impacts. Further, any cumulative projects would also need to comply with SDAPCD Rules for dust control and construction equipment, which would further reduce the likelihood of a cumulatively considerable construction air quality impact. Therefore, Project construction is not anticipated to result in a cumulatively significant impact on air quality.

Section 4.2 concludes that the Project would not result in a direct impact to air quality during construction; and as discussed in Section 4.4 below, the Project would not have significant impacts to sensitive receptors.

In consideration of all these factors, construction of the Project would not result in a cumulatively considerable contribution to a significant air quality impact pertaining to NO_X, VOCs, PM_{10}, and $PM_{2.5}$.

4.3.1.3 *Mitigation Measures and Design Considerations*

Control measures for construction are discussed in Section 4.2.1.3. As discussed in that section, implementation of standard construction mitigation measures controlling fugitive dust emissions would minimize the Project's contribution to cumulative air quality impacts from construction activities. Cumulative projects would also need to comply with SDAPCD Rules for dust control and construction equipment. No other mitigation measures would be required.

4.3.1.4 *Conclusions*

Cumulative impacts associated with Project construction would be less than cumulatively considerable and therefore less than significant.

4.3.2 Operational Impacts

As discussed above, based on the County Guidelines (2007), a project would result in a cumulatively significant impact if the project results in a significant contribution to the cumulative increase in NO_X, VOCs, PM_{10}, and $PM_{2.5}$. In accordance with the guidelines, a project that does not conform to the RAQS and/or has a significant direct impact on air quality with regard to operational emissions of nonattainment pollutants would also have a cumulatively considerable net increase. Also, projects that cause road intersections to operate at or below a LOS E and create a CO hot spot create a cumulatively considerable net increase of CO.

4.3.2.1 *Guidelines for the Determination of Significance*

The following thresholds are used for the assessment of cumulatively considerable net increases in air pollutants during the operational phase:

Would the project not conform to the RAQS and/or have a significant direct impact on air quality with regard to operational emissions of PM_{10}, $PM_{2.5}$, NO_X, and/or VOCs, which would also have a significant cumulatively considerable net increase in these emissions?

Would the project cause road intersections or roadway segments to operate at or below LOS E and create a CO hotspot that would result in a cumulatively considerable net increase of CO?

4.3.2.2 *Significance of Impacts Prior to Mitigation*

As described in Sections 4.1 and 4.2, the proposed Project would not be consistent with the RAQS, but would not exceed the County's screening-level thresholds. As discussed in Section 4.2.2.2, the Project would not create a CO hotspot that would result in a cumulatively considerable net increase of CO. Therefore, the Project would not create a cumulatively considerable net increase in criteria pollutants associated with operation and impacts would be less than significant relative to criteria pollutant emissions.

4.3.2.3 *Mitigation Measures and Design Considerations*

As discussed in Section 4.1.3, the Project addresses the General Plan goals that are relevant to the Project site. With implementation of those measures, the Project would not exceed the significance thresholds established by the County; therefore, impacts would be less than significant and no mitigation is required.

4.3.2.4 *Conclusions*

Cumulative impacts associated with Project operation would be less than significant.

4.4 <u>Impacts to Sensitive Receptors</u>

4.4.1 Guidelines for the Determination of Significance

Would the project expose sensitive receptors to substantial pollutant concentrations?

The guidelines of significance listed below are used by the County to address the above question:

- *Would the project place sensitive receptors near CO "hot spots" or creates CO "hot spots" near sensitive receptors?*

- *Would project implementation result in exposure to TACs resulting in a maximum incremental cancer risk greater than 1 in 1 million without application of Toxics-Best Available Control Technology or a health hazard index (HI) greater than 1, and thus be deemed as having a potentially significant impact?*

4.4.2 Significance of Impacts Prior to Mitigation

CO Concentrations (CO Hot Spot Analysis)

The discussions and results of the CO hot spot analysis were previously mentioned in Section 4.2.2.2. As previously presented in Table 14, all CO impacts, when added to background CO concentrations, would be below the CAAQS for both the 1-hour and 8-hour averaging periods; therefore, the Project would not result in a significant impact for CO.

Construction-related Diesel Health Risk

DPM emissions would be released from the on-site construction equipment and from haul trucks associated with the Project. The CARB has declared that DPM from diesel engine exhaust is a TAC. Additionally, the OEHHA has determined that chronic exposure to DPM can cause carcinogenic and non-carcinogenic health effects.

The EPA SCREEN3 model, the screening air dispersion modeling method approved by the CARB for such assessments was used to estimate concentrations of DPM from the construction of the Project. The on-site DPM construction equipment emissions were estimated from emission calculation and amount to a maximum of 6.61 pounds per day of DPM (as PM_{10} exhaust) from when the backbone infrastructure and road construction activities overlap. The emissions were represented in the model as an area source equal to the size of the Project's construction area. An emission release height of 10 feet (3 meters) was also assumed. Receptor locations where construction impacts were calculated focused on the residential receptors located west of the Project site because they would be closest to Project-generated emissions.

Cancer Health Risk Assessment Methodology

The cancer risk is calculated by multiplying the annual average concentrations calculated using the SCREEN3 model and an inhalation exposure factor as in Equation 1 below (Office of Environmental Health Hazard Assessment 2003).

Cancer Risk = Inhalation cancer potency factor (CPF) x Dose-inhalation

Where:

Cancer Risk = Total individual lifetime excess cancer risk defined as the cancer risk a hypothetical individual faces if exposed to carcinogenic emissions from a particular facility; this risk is defined as an excess risk because it is above and beyond the background cancer risk to the population contributed by emission sources not related to the Project; cancer risk is expressed in terms of risk per million exposed individuals.

Dose-inhalation = (Cair x DBR x A x EF x ED) / AT

Where:

Cair = annual average concentration
DBR = daily breathing rate,
A = inhalation absorption factor
EF = exposure frequency
ED = exposure duration
AT = average time period over which the exposure is averaged.

Cair is the annual average concentration at the closest receptor calculated from SCREEN3 in $\mu g/m^3$. With the worst-case meteorological condition under SCREEN3, the location of the highest 1-hour DPM concentration value was modeled to be 0.25 miles from the Project boundary. At this location, the 1-hour DPM concentration value was calculated to be 0.02485 $\mu g/m^3$. The SCREEN3 model outputs and screening health risk calculations are provided in Appendix B of this report. The other values listed in equations above are shown in Table 15, *Inhalation Exposure Factor Values for Sensitive/Residential Receptors*.

Table 15
INHALATION EXPOSURE FACTOR VALUES FOR SENSITIVE/RESIDENTIAL RECEPTORS

Receptor	CPF (mg/kg-day)-1	DBR (liters/kg-day)	EF (days/year)	ED (years)	AT (days)
Construction (DPM)	1.1	302	260	4.0	25,550

Source: Bay Area Air Quality Management District, 2012.
CPF = cancer potency factor (from Office of Environmental Health Hazard Assessment 2012)
DPM = diesel particulate matter, DBR = daily breathing rate, EF = exposure frequency
ED = exposure duration (for construction, this represents the construction period of 4 years)
AT = average time period over which the exposure is averaged.

Applying Equations 1 and 2 with the values for the various factors shown in Table 16, the Cancer Risk is calculated as follows:

Construction Cancer Risk DPM = CDPM (average DPM concentration from SCREEN3 in $\mu g/m^3$) x 1.4 (risk per million for sensitive/residential receptors)

Non-Cancer Health Risk Characterization

Chronic Non-Cancer Impacts

Exposures to TACs such as DPM can also cause chronic (long-term) and acute (short-term) related non-cancer illnesses such as reproductive effects, respiratory effects, eye sensitivity, immune effects, kidney effects, blood effects, central nervous system, birth defects, or other adverse environmental effects. Risk characterization for non-cancer health risks is expressed as an HI. The HI is a ratio of the predicted concentration of a project's emissions to a concentration considered acceptable to public health professionals, termed the REL. When evaluating chronic non-cancer effects due to TAC exposures, a hazard quotient (HQ) is established for each individual TAC as follows and for each target organ affected by the individual TAC:

HI= Cair/REL

Where:

HI = chronic hazard index
Cair = Annual average concentration (µg/m^3)
REL = Chronic Reference Exposure Level (µg/m^3)

To evaluate the potential for adverse non-cancer health effects from simultaneous exposure to multiple TACs, the HQs for all TACs that affect the same target organ are summed yielding a hazard index (HI) as follows:

HIto = Σιο HQtac

Where:

HIto = sum of the hazard quotients for all TACs affecting the same target organ
HQtac = hazard quotient for TAC and target organ.

OEHHA has assigned a chronic non-cancer REL of 5 µg/m^3 for DPM (OEHHA 2012). DPM has effects on the respiratory system, which accounts for essentially all of the potential chronic non-cancer hazards from DPM. Therefore, the only HI calculated was for the respiratory system.

Table 16, *Construction Health Risk Assessment Results*, provides the results of the construction health risk assessment for project construction along with the County's Guidelines for Determining Significance health risk thresholds. As shown in the table, the construction emissions would not exceed the County's Guidelines for Determining Significance health risk thresholds for cancer risk and chronic non-cancer hazard.

Table 16
CONSTRUCTION HEALTH RISK ASSESSMENT RESULTS

Metric	Dispersion Model Estimate	District's Significance Threshold	Exceeds Threshold?
Cancer Risk[1]	0.03 in 1 million	1 in 1 million	No
Chronic Non-Cancer Hazard Index from DPM[2]	0.0005	1.0	No

Source: Appendix B
[1] Assumes an exposure frequency of 260 days, exposure duration of 4.0 years, and an age sensitivity factor of 1 (Bay Area Air Quality Management District 2012)
[2] Assumes a chronic DPM reference exposure level of 5 µg/m^3 (Office of Environmental Health Hazard Assessment 2012)

Diesel exhaust particulate matter is known in the state of California to contain carcinogenic compounds. The risks associated with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure (i.e., 24 hours per day, seven days per week, 365 days per year for 70 years). Because the Project-related construction emissions of diesel exhaust would occur for less than four years, the Proposed Project would not result in long-term chronic lifetime exposure to diesel exhaust from heavy-duty diesel equipment. Therefore, air quality impacts related to exposure of sensitive receptors to substantial pollutant concentrations would be less than significant.

Operation-related Health Risk

Residential development projects do not typically generate any TAC emissions. Therefore, the operational impacts of the land use in relation to generation of TACs would be less than significant.

WTWRF treatment of influent would produce emissions of TACs during reaction or degradation. As previously mentioned in Section 4.2.2.2, the emission data for the WTWRF was obtained from the San Joaquin Valley APCD's *Fugitive Air Emission Factors and Concentration Values for Wastewater Treatment Plants* (SJVAPCD 1993). Emissions are determined by the multiplications of the wastewater flow and the concentration of the pollutant. The peak daily wastewater flow was assumed to be 0.18 mgd. The following formula was used to calculate the WTWRF emissions:

> Daily Emissions (lbs/day) = peak daily influent flow (gal/day) x liquid conversion factor (3.785 L/gal) x toxic influent concentration (µg/L) x unit conversion factor (10^{-6} g/µg) x lbs/453.6 g.

The annual emissions of TACs from WTWRF are summarized in Table 17, *WTWRF Health Risk Assessment Results*. A screening health risk assessment was prepared to analyze cancer, chronic non-cancer, and acute non-cancer health risks from the facility. The cancer risk is calculated by multiplying the annual average concentrations calculated using the SCREEN3 model and the inhalation cancer unit risk and cancer potency factors for the five identified TAC compounds (i.e., benzene, chloroform, ethyl benzene, methylene chlorine, 1,4-dichlorobenzene, and TCE) through OEHHA's Technical Support Document updated in 2011. The non-cancer chronic and acute risks are calculated by dividing the REL values to the 24-hour average concentrations for each TAC compound. The screening health risk calculations for the WTWRF are provided in Appendix B of this report. The location of maximum impact (MEI) was modeled at 728 feet from the property boundary of the WTWRF study area. At this location, the modeled cancer risk is 0.007 in 1 million, the chronic non-cancer inhalation hazard index is less than one, and the acute non-cancer inhalation hazard index is less than 1. These results are less than the SDAPCD standards discussed previously. Therefore, the increased health risks from the proposed facility would be less than significant.

Table 17 WTWRF HEALTH RISK ASSESSMENT RESULTS					
Compound	**Annual Average Emissions (lbs/year)**	**Annual Ambient Conc. (μg/m^3)**	**Cancer Risk**	**Chronic Non-cancer Risk**	**24-hour (Acute) Non-cancer Risk**
Ammonia	6.57E-03	1.41E-08	-	7.06E-11	1.76E-11
Benzene	1.27E-05	2.73E-11	8.25E-10	9.11E-12	4.05E-12
Chloroform	1.78E-04	3.82E-10	2.19E-09	1.27E-12	1.02E-11
Ethyl Benzene	4.93E-05	1.06E-10	2.79E-10	5.30E-14	-
Hydrogen Sulfide	4.28E-04	9.19E-10	-	9.19E-11	8.75E-11
1,1,1-TCA	5.81E-05	1.25E-10	-	1.25E-13	7.35E-15
Methylene Chlorine	1.71E-04	3.68E-10	3.89E-10	9.19E-13	1.05E-13
1,4-Dichlorobenzene	1.02E-04	2.19E-10	2.65E-09	2.74E-13	-
Phenol	2.15E-04	4.62E-10	-	2.31E-12	3.19E-13
Styrene	1.10E-04	2.36E-10	-	2.62E-13	4.49E-14
Toluene	1.07E-04	2.31E-10	-	7.70E-13	2.50E-14
TCE	5.70E-05	1.23E-10	2.59E-10	2.04E-13	-
Xylene	1.29E-04	2.76E-10	-	3.95E-13	5.02E-14
TOTAL	**8.18E-03**	**-**	**6.59E-09**	**<1**	**<1**

Sources: Emission factors from SJVAPCD's *Fugitive Air Emission Factors and Concentration Values for Wastewater Treatment Plants* (POTWS) November 1993.
OEHHA Revised Air Toxics Hot Spots Program Technical Support Document for Unit Risk and Cancer Potency Values Updated 2011. http://www.oehha.ca.gov/air/hot_spots/2009/AppendixA.pdf
OEHHA Acute and Chronic Reference Exposure Levels (RELs) as of August 2013.
http://oehha.ca.gov/air/allrel/html.
Notes:
Assumed hydrogen sulfide would be controlled to 90% efficiency with scrubbers or biofilters that are part of the odor control system.
Cancer risk less than 10 in a million is considered less than significant.
Chronic and acute non-cancer risks less than 1 are considered less than significant.

4.4.3 Mitigation Measures and Design Considerations

Impacts are less than significant, therefore, no mitigation measures are required.

4.4.4 Conclusions

Impacts to sensitive receptors would be less than significant.

4.5 Odor Impacts

4.5.1 Guidelines for the Determination of Significance

Based on the County Guidelines (2007), a project would have a significant impact if it would generate objectionable odors or place sensitive receptors next to existing objectionable odors that would affect a considerable number of persons or the public.

SDAPCD Rule 51 (Public Nuisance) and California Health & Safety Code, Division 26, Part 4, Chapter 3, Section 541700, prohibit the emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of the public. Projects required to obtain permits from SDAPCD, typically industrial and some commercial projects, are evaluated by SDAPCD staff for potential odor nuisance and conditions may be applied (or control equipment required), where necessary, to prevent occurrence of public nuisance.

4.5.2 Significance of Impacts Prior to Mitigation

4.5.2.1 *Construction*

Project construction could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. Diesel exhaust and VOCs would be emitted during construction of the Project, which are objectionable to some; however, emissions would disperse rapidly from the Project site and therefore should not be at a level to affect a substantial number of people. Because the construction equipment would be operating at various locations throughout the construction site, and because any operation that would occur in the vicinity of existing receptors would be temporary, impacts associated with odors during construction are not considered significant.

4.5.2.2 *Residential and Commercial Uses*

The Project's commercial uses would be required to comply with the County's Zoning Ordinance, Section 6318, preventing the release of unpleasant odors which are perceptible by the average person. The residential development itself would not be a source of odor impacts. According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations. Therefore, impacts associated with odor sources are considered less than significant.

4.5.2.3 *WTWRF*

Operation of the WTWRF has the potential to result in odor impacts because of the nature of the activities at the proposed facility. However, the frequency with which the facility would expose the public to objectionable odors would be minimal based on the control measures planned in the design. All WTWRF facilities would be covered to avoid uncontrolled odor release. Section 6318 of the San Diego County Zoning Ordinance states that "All commercial and industrial uses shall be so operated as not to emit matter causing unpleasant odors which are perceptible by the average person at or beyond any lot line of the lot containing said uses." Additionally, Section 6318 requires that odors be diluted by "a ratio of one volume of odorous air to eight or more volumes of clean air." Active odor control units would be located to manage gases from the wet and solids stream treatment processes. All processes and equipment would be housed (or otherwise contained) and ventilation controlled such that no objectionable odors would be discernible at the Project site boundaries.

Odors are typically associated with particular steps in the wastewater treatment process. Initially, raw wastewater is transferred to the primary clarifiers where most solids are separated from the liquid portion of wastewater in the treatment process. A ferrous chloride solution is added to the raw wastewater before it enters the primary clarifiers to reduce odors at that treatment stage.

Ferrous chloride molecules capture hydrogen sulfide molecules, forming insoluble compounds that precipitate out of the waste stream.

Wastewater undergoing aerobic digestion (decomposition with free oxygen) in the aeration basins emits a characteristically musty odor due to the particular type of biogases released in the process. A misting system with odor neutralizing liquids breaks down the foul smelling chemical compounds in the biogases. Chlorine gas is used to disinfect the non-potable water, which is used daily to wash down all areas of the plant. Bio filters remove odor by capturing the odor causing compounds in a media bed where they are oxidized by naturally occurring micro-organisms.

Facilities that cause nuisance odors are subject to enforcement action by the SDAPCD. The SDAPCD responds to odor complaints by investigating the complaint determining whether the odor violated SDAPCD Rule 51. The inspector will take enforcement action if the source is not in compliance with SDAPCD rules and regulations and will inform the complainant of investigation results. In the event of enforcement action, odor-causing impacts must be mitigated by appropriate means to reduce the impacts to sensitive receptors. Such means include shutdown of odor sources or requirements to control odors using add-on equipment.

The odor control design for the facility would be such that no objectionable odors would be detected by nearby residences or other sensitive receptors. Additionally, disposal of biosolids at landfill sites could also contribute to odors and increase air emissions at these end-use facilities. However, the County would only allow facilities that have addressed all site-specific impacts. Therefore, this impact would be less than significant.

4.5.3 Mitigation Measures and Design Considerations

Odor control measures for the WTWRF are discussed in Sections 1.3 and 4.5.2. As discussed in those sections, implementation of standard odor control measures would minimize the Project's contribution to objectionable odors. The Project would comply with SDAPCD Rule 51 and would not place sensitive receptors near existing odor sources that would affect a considerable number of persons or the public; therefore, no mitigation measures or additional design considerations are required.

4.5.4 Conclusion

Due to the nature of the development, there are no significant odorous air emissions anticipated from normal operations at the HGV South development. Impacts associated with operation of the WTWRF would be less than significant.

5.0 SUMMARY OF RECOMMENDED PROJECT DESIGN FEATURES, IMPACTS, AND MITIGATION

5.1 Project Design Features

As described in Section 1.3, the Project would incorporate measures to minimize fugitive dust control emissions, including watering twice per day during grading and stabilization of storage piles. The Project would comply with Rule 55, which requires that no visible dust is emitted beyond the property line for a period or periods aggregating more than 3 minutes in any 60-minute period, and would incorporate measures to minimize the track-out/carry-out of visible roadway dust.

A wide range of current regulatory codes, Project design features, and other measures would be incorporated into the Proposed Project. The Project would incorporate energy-efficiency features that would meet 2016 California Title 24 Energy Efficiency Standards. The Project would include features such as a variety of energy-efficient building materials, 100 percent of the Project energy needs provided through renewable sources, solar ready roofs for the remainder of structures, and energy star appliances. Low volatile organic compound (VOC) coatings will be used during construction and maintenance in accordance with SDAPCD Rule 67 requirements. Only natural gas fireplaces would be installed in the residential dwelling units.

5.2 Project Impacts

The control measures listed above constitute BMPs for dust control. With the implementation of the fugitive dust control measures as the Project design features, the phased construction impacts would be less than significant.

Operational emissions would be associated with vehicle trips generated by the HGV South development, along with area sources such as energy use and landscaping. Based on the evaluation of air emissions, the Project emissions would be below the screening-level thresholds for VOCs, CO, PM_{10}, and $PM_{2.5}$ and would be less than significant for air quality. Similarly, the Project would not result in any cumulatively considerable emissions of nonattainment air pollutants that would exceed the screening level thresholds.

Based on the analysis presented in Section 4.1, the Project would be inconsistent with the RAQS and SIP, which is considered a temporary significant impact. As a result, the cumulative considerable contribution to the regional air quality impact also is considered significant. These significant impacts will be addressed when the RAQS are updated, as indicated below.

Impacts associated with exposure of sensitive receptors to substantial pollutant concentrations would be less than significant.

An evaluation of odors from general Project construction and operation of the Project area indicated that odor impacts would be less than significant.

5.3 Project Mitigation

The Project would result in significant Project-level and cumulatively considerable impacts associated with non-conformance to the regional air quality plan because the Project would be inconsistent with the RAQS and SIP.M-AQ-1 in Section 4.1.3, above, requires provision of a revised housing forecast to SANDAG to ensure that any revisions to the population and employment projections used by the SDAPCD in updating the RAQS and SIP will accurately reflect anticipated growth due to the Proposed Project. As noted in the conclusion for that discussion, those significant impacts will be reduced to less than significant when the RAQs are updated.

The provision of housing information would assist SANDAG in revising the housing forecast. Until the anticipated growth is included in the emission estimates of the RAQS and the SIP, however, the direct and cumulative impacts would remain significant and unavoidable.

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Appendix A

CONSTRUCTION AND OPERATION CRITERIA POLLUTANT MODELING

Harmony Grove Village South

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	46.00	Space	0.41	18,400.00	0
City Park	1.50	Acre	1.50	65,340.00	0
Condo/Townhouse	260.00	Dwelling Unit	16.25	260,000.00	744
Single Family Housing	193.00	Dwelling Unit	62.66	347,400.00	552
Strip Mall	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.6 **Precipitation Freq (Days)** 40

Climate Zone 13 **Operational Year** 2021

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 720.49 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on input from Kovach (dated 02-27-2017)

Off-road Equipment -

Off-road Equipment - typical equipment used for the backbone infrastructure phase

Off-road Equipment - Based on input from Moffatt & Nichol

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Crusher added to process Blasing debris

Trips and VMT -

Grading -

Architectural Coating - Low-VOC coatings per design feature

Vehicle Trips - Trip generation based on LLG2014; trip length based on LLG2016.

Construction Off-road Equipment Mitigation -

Area Mitigation - Natural Gas hearths and low-VOC coatings per design features

Energy Mitigation - CalEEMod default is 2008 T24. 2013 is 25% improved over 2008. 2016 is 28% improved over 2013. (1-.25)*(1-.28)=54% - 46% improvement

Water Mitigation -

Waste Mitigation -

Operational Off-Road Equipment - WTWRF generator sets

Vechicle Emission Factors -

Vechicle Emission Factors -

Vechicle Emission Factors -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	100.00

tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	50
tblConstructionPhase	NumDays	110.00	109.00
tblConstructionPhase	NumDays	1,550.00	262.00
tblConstructionPhase	NumDays	1,550.00	589.00
tblConstructionPhase	NumDays	155.00	65.00
tblConstructionPhase	NumDays	110.00	109.00
tblConstructionPhase	NumDays	60.00	65.00
tblConstructionPhase	PhaseEndDate	3/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	6/30/2020	3/31/2020
tblConstructionPhase	PhaseEndDate	7/4/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	6/28/2019	6/30/2019
tblConstructionPhase	PhaseEndDate	3/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	9/28/2018	9/30/2018
tblConstructionPhase	PhaseEndDate	3/29/2019	3/31/2019
tblConstructionPhase	PhaseStartDate	10/1/2021	5/1/2021
tblConstructionPhase	PhaseStartDate	7/1/2019	4/1/2019
tblConstructionPhase	PhaseStartDate	4/1/2020	7/1/2019
tblConstructionPhase	PhaseStartDate	10/1/2021	5/1/2021
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00

tblProjectCharacteristics	OperationalYear	2014	2021
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	HW_TL	10.80	7.88
tblVehicleTrips	HW_TL	10.80	7.88
tblVehicleTrips	ST_TR	1.59	0.00
tblVehicleTrips	ST_TR	7.16	9.93
tblVehicleTrips	ST_TR	10.08	9.93
tblVehicleTrips	ST_TR	42.04	0.00
tblVehicleTrips	SU_TR	1.59	0.00
tblVehicleTrips	SU_TR	6.07	9.93
tblVehicleTrips	SU_TR	8.77	9.93
tblVehicleTrips	SU_TR	20.43	0.00
tblVehicleTrips	WD_TR	1.59	0.00
tblVehicleTrips	WD_TR	6.59	9.93
tblVehicleTrips	WD_TR	9.57	9.93
tblVehicleTrips	WD_TR	44.32	0.00

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	5.0314	50.2233	41.3413	0.0481	18.2306	2.6987	20.9292	9.9743	2.5094	12.4836	0.0000	4,755.2424	4,755.2424	1.2948	0.0000	4,782.4332
2019	9.3770	89.0302	81.0180	0.1530	11.6626	4.2373	15.8999	4.3978	3.9536	8.3513	0.0000	13,610.0366	13,610.0366	2.7879	0.0000	13,668.5831
2020	7.5187	55.2022	72.3509	0.1529	5.6500	2.6958	8.3457	1.5154	2.5510	4.0663	0.0000	13,164.3279	13,164.3279	1.5567	0.0000	13,197.0195
2021	54.4411	35.7984	50.8559	0.1028	3.4329	1.7910	5.2239	0.9189	1.6747	2.5937	0.0000	8,885.2749	8,885.2749	1.4593	0.0000	8,915.9204
Total	**76.3682**	**230.2541**	**245.5661**	**0.4568**	**38.9760**	**11.4227**	**50.3987**	**16.8063**	**10.6886**	**27.4949**	**0.0000**	**40,414.8818**	**40,414.8818**	**7.0988**	**0.0000**	**40,563.9563**

2.1 Overall Construction (Maximum Daily Emission)

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	5.0314	50.2233	41.3413	0.0481	8.2941	2.6987	10.9928	4.5124	2.5094	7.0217	0.0000	4,755.2424	4,755.2424	1.2948	0.0000	4,782.4332
2019	9.3770	89.0302	81.0180	0.1530	6.8923	4.2373	11.1296	2.4197	3.9536	6.3733	0.0000	13,610.0366	13,610.0366	2.7879	0.0000	13,668.5831
2020	7.5187	55.2022	72.3509	0.1529	5.6500	2.6958	8.3457	1.5154	2.5510	4.0663	0.0000	13,164.3279	13,164.3279	1.5567	0.0000	13,197.0195
2021	54.4411	35.7984	50.8559	0.1028	3.4329	1.7910	5.2239	0.9189	1.6747	2.5937	0.0000	8,885.2749	8,885.2749	1.4593	0.0000	8,915.9204
Total	**76.3682**	**230.2541**	**245.5661**	**0.4568**	**24.2693**	**11.4227**	**35.6919**	**9.3664**	**10.6886**	**20.0550**	**0.0000**	**40,414.8818**	**40,414.8818**	**7.0988**	**0.0000**	**40,563.9562**

	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**	**37.73**	**0.00**	**29.18**	**44.27**	**0.00**	**27.06**	**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	714.9581	9.8382	891.4925	0.3356		120.1929	120.1929		120.1894	120.1894	12,580.5940	5,343.4233	17,924.0174	11.6750	0.9896	18,475.9565
Energy	0.2640	2.2559	0.9613	0.0144		0.1824	0.1824		0.1824	0.1824		2,879.6927	2,879.6927	0.0552	0.0528	2,897.2180
Mobile	13.0771	23.8596	123.6794	0.3321	23.4405	0.3773	23.8179	6.2570	0.3483	6.6053		25,072.5592	25,072.5592	0.9588		25,092.6939
Offroad	0.7148	6.3323	7.3694	0.0132		0.3355	0.3355		0.3355	0.3355		1,246.0691	1,246.0691	0.0636		1,247.4045
Total	**729.0140**	**42.2860**	**1,023.5025**	**0.6952**	**23.4405**	**121.0881**	**144.5286**	**6.2570**	**121.0555**	**127.3125**	**12,580.5940**	**34,541.7443**	**47,122.3384**	**12.7526**	**1.0424**	**47,713.2728**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	18.3058	0.4324	37.5028	1.9700e-003		0.7533	0.7533		0.7475	0.7475	0.0000	8,700.9528	8,700.9528	0.2307	0.1583	8,754.8658
Energy	0.1685	1.4400	0.6137	9.1900e-003		0.1164	0.1164		0.1164	0.1164		1,838.0657	1,838.0657	0.0352	0.0337	1,849.2518
Mobile	13.0771	23.8596	123.6794	0.3321	23.4405	0.3773	23.8179	6.2570	0.3483	6.6053		25,072.5592	25,072.5592	0.9588		25,092.6939
Offroad	0.7148	6.3323	7.3694	0.0132		0.3355	0.3355		0.3355	0.3355		1,246.0691	1,246.0691	0.0636		1,247.4045
Total	**32.2662**	**32.0643**	**169.1653**	**0.3564**	**23.4405**	**1.5825**	**25.0230**	**6.2570**	**1.5477**	**7.8047**	**0.0000**	**36,857.6467**	**36,857.6467**	**1.2883**	**0.1920**	**36,944.2160**

	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	**95.67**	**39.15**	**84.19**	**50.63**	**0.00**	**98.97**	**82.92**	**0.00**	**99.00**	**94.13**	**100.00**	**-3.10**	**24.43**	**90.40**	**81.58**	**25.18**

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	7/1/2018	9/30/2018	5	65	
2	Backbone Infrastructure	Trenching	10/1/2018	3/31/2019	5	130	
3	Grading	Grading	4/1/2019	6/30/2019	5	65	
4	Bridge Construction	Building Construction	4/1/2019	3/31/2020	5	262	
5	Building Construction	Building Construction	7/1/2019	9/30/2021	5	589	
6	Paving	Paving	5/1/2021	9/30/2021	5	109	
7	Architectural Coating	Architectural Coating	5/1/2021	9/30/2021	5	109	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 162.5

Acres of Paving: 0

Residential Indoor: 1,229,985; Residential Outdoor: 409,995; Non-Residential Indoor: 106,338; Non-Residential Outdoor: 35,446 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crushing/Proc. Equipment	1	8.00	85	0.78
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Backbone Infrastructure	Forklifts	1	8.00	89	0.20
Backbone Infrastructure	Off-Highway Trucks	2	8.00	400	0.38
Backbone Infrastructure	Other Material Handling Equipment	1	8.00	167	0.40
Backbone Infrastructure	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Backbone Infrastructure	Trenchers	1	8.00	80	0.50
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41

Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Bridge Construction	Cranes	2	7.00	226	0.29
Bridge Construction	Forklifts	1	8.00	89	0.20
Bridge Construction	Generator Sets	2	8.00	84	0.74
Bridge Construction	Pumps	1	8.00	84	0.74
Bridge Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Bridge Construction	Welders	0	8.00	46	0.45
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Site Preparation	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Backbone Infrastructure	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Construction	9	293.00	63.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	293.00	63.00	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
Architectural Coating	1	59.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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	4.9704	50.1470	40.6348	0.0461		2.6975	2.6975		2.5083	2.5083		4,604.3033	4,604.3033	1.2873		4,631.3368
Total	**4.9704**	**50.1470**	**40.6348**	**0.0461**	**18.0663**	**2.6975**	**20.7638**	**9.9307**	**2.5083**	**12.4389**		**4,604.3033**	**4,604.3033**	**1.2873**		**4,631.3368**

3.2 Site Preparation - 2018

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	0.0610	0.0763	0.7065	1.9500e-003	0.1643	1.1700e-003	0.1655	0.0436	1.0800e-003	0.0447		150.9392	150.9392	7.4900e-003		151.0965
Total	**0.0610**	**0.0763**	**0.7065**	**1.9500e-003**	**0.1643**	**1.1700e-003**	**0.1655**	**0.0436**	**1.0800e-003**	**0.0447**		**150.9392**	**150.9392**	**7.4900e-003**		**151.0965**

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					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.9704	50.1470	40.6348	0.0461		2.6975	2.6975		2.5083	2.5083	0.0000	4,604.3033	4,604.3033	1.2873		4,631.3368
Total	**4.9704**	**50.1470**	**40.6348**	**0.0461**	**8.1298**	**2.6975**	**10.8273**	**4.4688**	**2.5083**	**6.9771**	**0.0000**	**4,604.3033**	**4,604.3033**	**1.2873**		**4,631.3368**

3.2 Site Preparation - 2018

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	0.0610	0.0763	0.7065	1.9500e-003	0.1643	1.1700e-003	0.1655	0.0436	1.0800e-003	0.0447		150.9392	150.9392	7.4900e-003		151.0965
Total	**0.0610**	**0.0763**	**0.7065**	**1.9500e-003**	**0.1643**	**1.1700e-003**	**0.1655**	**0.0436**	**1.0800e-003**	**0.0447**		**150.9392**	**150.9392**	**7.4900e-003**		**151.0965**

3.3 Backbone Infrastructure - 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	2.7988	28.5418	18.1282	0.0398		1.4141	1.4141		1.3009	1.3009		3,999.7554	3,999.7554	1.2452		4,025.9041
Total	**2.7988**	**28.5418**	**18.1282**	**0.0398**		**1.4141**	**1.4141**		**1.3009**	**1.3009**		**3,999.7554**	**3,999.7554**	**1.2452**		**4,025.9041**

3.3 Backbone Infrastructure - 2018

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	0.0458	0.0573	0.5299	1.4600e-003	0.1232	8.8000e-004	0.1241	0.0327	8.1000e-004	0.0335		113.2044	113.2044	5.6200e-003		113.3224
Total	**0.0458**	**0.0573**	**0.5299**	**1.4600e-003**	**0.1232**	**8.8000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**113.2044**	**113.2044**	**5.6200e-003**		**113.3224**

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	2.7988	28.5418	18.1282	0.0398		1.4141	1.4141		1.3009	1.3009	0.0000	3,999.7554	3,999.7554	1.2452		4,025.9041
Total	**2.7988**	**28.5418**	**18.1282**	**0.0398**		**1.4141**	**1.4141**		**1.3009**	**1.3009**	**0.0000**	**3,999.7554**	**3,999.7554**	**1.2452**		**4,025.9041**

3.3 Backbone Infrastructure - 2018

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	0.0458	0.0573	0.5299	1.4600e-003	0.1232	8.8000e-004	0.1241	0.0327	8.1000e-004	0.0335		113.2044	113.2044	5.6200e-003		113.3224
Total	**0.0458**	**0.0573**	**0.5299**	**1.4600e-003**	**0.1232**	**8.8000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**113.2044**	**113.2044**	**5.6200e-003**		**113.3224**

3.3 Backbone Infrastructure - 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	2.5513	25.0667	17.6222	0.0397		1.2348	1.2348		1.1360	1.1360		3,933.9928	3,933.9928	1.2447		3,960.1309
Total	**2.5513**	**25.0667**	**17.6222**	**0.0397**		**1.2348**	**1.2348**		**1.1360**	**1.1360**		**3,933.9928**	**3,933.9928**	**1.2447**		**3,960.1309**

3.3 Backbone Infrastructure - 2019

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	0.0425	0.0529	0.4869	1.4600e-003	0.1232	8.7000e-004	0.1241	0.0327	8.1000e-004	0.0335		109.1082	109.1082	5.2800e-003		109.2192
Total	**0.0425**	**0.0529**	**0.4869**	**1.4600e-003**	**0.1232**	**8.7000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**109.1082**	**109.1082**	**5.2800e-003**		**109.2192**

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	2.5513	25.0667	17.6222	0.0397		1.2348	1.2348		1.1360	1.1360	0.0000	3,933.992 8	3,933.992 8	1.2447		3,960.130 9
Total	**2.5513**	**25.0667**	**17.6222**	**0.0397**		**1.2348**	**1.2348**		**1.1360**	**1.1360**	**0.0000**	**3,933.992 8**	**3,933.992 8**	**1.2447**		**3,960.130 9**

3.3 Backbone Infrastructure - 2019

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	0.0425	0.0529	0.4869	1.4600e-003	0.1232	8.7000e-004	0.1241	0.0327	8.1000e-004	0.0335		109.1082	109.1082	5.2800e-003		109.2192
Total	**0.0425**	**0.0529**	**0.4869**	**1.4600e-003**	**0.1232**	**8.7000e-004**	**0.1241**	**0.0327**	**8.1000e-004**	**0.0335**		**109.1082**	**109.1082**	**5.2800e-003**		**109.2192**

3.4 Grading - 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					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.8912	54.1978	40.2888	0.0617		2.5049	2.5049		2.3045	2.3045		6,111.3121	6,111.3121	1.9336		6,151.9167
Total	**4.8912**	**54.1978**	**40.2888**	**0.0617**	**8.6733**	**2.5049**	**11.1783**	**3.5965**	**2.3045**	**5.9010**		**6,111.3121**	**6,111.3121**	**1.9336**		**6,151.9167**

3.4 Grading - 2019

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	0.0566	0.0705	0.6492	1.9500e-003	0.1643	1.1600e-003	0.1655	0.0436	1.0800e-003	0.0447		145.4776	145.4776	7.0400e-003		145.6256
Total	**0.0566**	**0.0705**	**0.6492**	**1.9500e-003**	**0.1643**	**1.1600e-003**	**0.1655**	**0.0436**	**1.0800e-003**	**0.0447**		**145.4776**	**145.4776**	**7.0400e-003**		**145.6256**

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					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.8912	54.1978	40.2888	0.0617		2.5049	2.5049		2.3045	2.3045	0.0000	6,111.3121	6,111.3121	1.9336		6,151.9167
Total	**4.8912**	**54.1978**	**40.2888**	**0.0617**	**3.9030**	**2.5049**	**6.4079**	**1.6184**	**2.3045**	**3.9230**	**0.0000**	**6,111.3121**	**6,111.3121**	**1.9336**		**6,151.9167**

3.4 Grading - 2019

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	0.0566	0.0705	0.6492	1.9500e-003	0.1643	1.1600e-003	0.1655	0.0436	1.0800e-003	0.0447		145.4776	145.4776	7.0400e-003		145.6256
Total	**0.0566**	**0.0705**	**0.6492**	**1.9500e-003**	**0.1643**	**1.1600e-003**	**0.1655**	**0.0436**	**1.0800e-003**	**0.0447**		**145.4776**	**145.4776**	**7.0400e-003**		**145.6256**

3.5 Bridge 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	2.9924	29.2382	22.3921	0.0393		1.6458	1.6458		1.5693	1.5693		3,805.7033	3,805.7033	0.7333		3,821.1029
Total	**2.9924**	**29.2382**	**22.3921**	**0.0393**		**1.6458**	**1.6458**		**1.5693**	**1.5693**		**3,805.7033**	**3,805.7033**	**0.7333**		**3,821.1029**

3.5 Bridge Construction - 2019

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	0.6073	4.4902	8.1778	0.0148	0.4181	0.0683	0.4864	0.1193	0.0629	0.1821		1,416.2966	1,416.2966	0.0108		1,416.5235
Worker	0.8296	1.0335	9.5101	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6542		2,131.2470	2,131.2470	0.1032		2,133.4144
Total	**1.4369**	**5.5237**	**17.6879**	**0.0434**	**2.8250**	**0.0854**	**2.9104**	**0.7577**	**0.0787**	**0.8363**		**3,547.5436**	**3,547.5436**	**0.1140**		**3,549.9379**

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	2.9924	29.2382	22.3921	0.0393		1.6458	1.6458		1.5693	1.5693	0.0000	3,805.7032	3,805.7032	0.7333		3,821.1028
Total	**2.9924**	**29.2382**	**22.3921**	**0.0393**		**1.6458**	**1.6458**		**1.5693**	**1.5693**	**0.0000**	**3,805.7032**	**3,805.7032**	**0.7333**		**3,821.1028**

3.5 Bridge Construction - 2019

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	0.6073	4.4902	8.1778	0.0148	0.4181	0.0683	0.4864	0.1193	0.0629	0.1821		1,416.2966	1,416.2966	0.0108		1,416.5235
Worker	0.8296	1.0335	9.5101	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6542		2,131.2470	2,131.2470	0.1032		2,133.4144
Total	**1.4369**	**5.5237**	**17.6879**	**0.0434**	**2.8250**	**0.0854**	**2.9104**	**0.7577**	**0.0787**	**0.8363**		**3,547.5436**	**3,547.5436**	**0.1140**		**3,549.9379**

3.5 Bridge Construction - 2020

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	2.6915	26.5407	21.9599	0.0393		1.4263	1.4263		1.3602	1.3602		3,763.3675	3,763.3675	0.7201		3,778.4892
Total	**2.6915**	**26.5407**	**21.9599**	**0.0393**		**1.4263**	**1.4263**		**1.3602**	**1.3602**		**3,763.3675**	**3,763.3675**	**0.7201**		**3,778.4892**

3.5 Bridge Construction - 2020

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	0.5735	3.8233	7.9083	0.0148	0.4181	0.0612	0.4793	0.1193	0.0563	0.1756		1,383.889 8	1,383.889 8	0.0105		1,384.109 7
Worker	0.7845	0.9655	8.8829	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6543		2,045.350 5	2,045.350 5	0.0981		2,047.411 5
Total	**1.3580**	**4.7888**	**16.7913**	**0.0434**	**2.8250**	**0.0783**	**2.9033**	**0.7577**	**0.0722**	**0.8298**		**3,429.240 3**	**3,429.240 3**	**0.1086**		**3,431.521 2**

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	2.6915	26.5407	21.9599	0.0393		1.4263	1.4263		1.3602	1.3602	0.0000	3,763.367 5	3,763.367 5	0.7201		3,778.489 2
Total	**2.6915**	**26.5407**	**21.9599**	**0.0393**		**1.4263**	**1.4263**		**1.3602**	**1.3602**	**0.0000**	**3,763.367 5**	**3,763.367 5**	**0.7201**		**3,778.489 2**

3.5 Bridge Construction - 2020

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	0.5735	3.8233	7.9083	0.0148	0.4181	0.0612	0.4793	0.1193	0.0563	0.1756		1,383.8898	1,383.8898	0.0105		1,384.1097
Worker	0.7845	0.9655	8.8829	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6543		2,045.3505	2,045.3505	0.0981		2,047.4115
Total	**1.3580**	**4.7888**	**16.7913**	**0.0434**	**2.8250**	**0.0783**	**2.9033**	**0.7577**	**0.0722**	**0.8298**		**3,429.2403**	**3,429.2403**	**0.1086**		**3,431.5212**

3.6 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	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083		2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**		**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

3.6 Building Construction - 2019

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	0.6073	4.4902	8.1778	0.0148	0.4181	0.0683	0.4864	0.1193	0.0629	0.1821		1,416.2966	1,416.2966	0.0108		1,416.5235
Worker	0.8296	1.0335	9.5101	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6542		2,131.2470	2,131.2470	0.1032		2,133.4144
Total	**1.4369**	**5.5237**	**17.6879**	**0.0434**	**2.8250**	**0.0854**	**2.9104**	**0.7577**	**0.0787**	**0.8363**		**3,547.5436**	**3,547.5436**	**0.1140**		**3,549.9379**

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	2.3516	20.9650	17.1204	0.0268		1.2850	1.2850		1.2083	1.2083	0.0000	2,580.7618	2,580.7618	0.6279		2,593.9479
Total	**2.3516**	**20.9650**	**17.1204**	**0.0268**		**1.2850**	**1.2850**		**1.2083**	**1.2083**	**0.0000**	**2,580.7618**	**2,580.7618**	**0.6279**		**2,593.9479**

3.6 Building Construction - 2019

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	0.6073	4.4902	8.1778	0.0148	0.4181	0.0683	0.4864	0.1193	0.0629	0.1821		1,416.296 6	1,416.296 6	0.0108		1,416.523 5
Worker	0.8296	1.0335	9.5101	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6542		2,131.247 0	2,131.247 0	0.1032		2,133.414 4
Total	**1.4369**	**5.5237**	**17.6879**	**0.0434**	**2.8250**	**0.0854**	**2.9104**	**0.7577**	**0.0787**	**0.8363**		**3,547.543 6**	**3,547.543 6**	**0.1140**		**3,549.937 9**

3.6 Building Construction - 2020

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	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465		2,542.479 9	2,542.479 9	0.6194		2,555.488 0
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**		**2,542.479 9**	**2,542.479 9**	**0.6194**		**2,555.488 0**

3.6 Building Construction - 2020

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	0.5735	3.8233	7.9083	0.0148	0.4181	0.0612	0.4793	0.1193	0.0563	0.1756		1,383.8898	1,383.8898	0.0105		1,384.1097
Worker	0.7845	0.9655	8.8829	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6543		2,045.3505	2,045.3505	0.0981		2,047.4115
Total	**1.3580**	**4.7888**	**16.7913**	**0.0434**	**2.8250**	**0.0783**	**2.9033**	**0.7577**	**0.0722**	**0.8298**		**3,429.2403**	**3,429.2403**	**0.1086**		**3,431.5212**

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	2.1113	19.0839	16.8084	0.0268		1.1128	1.1128		1.0465	1.0465	0.0000	2,542.4799	2,542.4799	0.6194		2,555.4880
Total	**2.1113**	**19.0839**	**16.8084**	**0.0268**		**1.1128**	**1.1128**		**1.0465**	**1.0465**	**0.0000**	**2,542.4799**	**2,542.4799**	**0.6194**		**2,555.4880**

3.6 Building Construction - 2020

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	0.5735	3.8233	7.9083	0.0148	0.4181	0.0612	0.4793	0.1193	0.0563	0.1756		1,383.889 8	1,383.889 8	0.0105		1,384.109 7
Worker	0.7845	0.9655	8.8829	0.0286	2.4069	0.0171	2.4240	0.6384	0.0158	0.6543		2,045.350 5	2,045.350 5	0.0981		2,047.411 5
Total	**1.3580**	**4.7888**	**16.7913**	**0.0434**	**2.8250**	**0.0783**	**2.9033**	**0.7577**	**0.0722**	**0.8298**		**3,429.240 3**	**3,429.240 3**	**0.1086**		**3,431.521 2**

3.6 Building Construction - 2021

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	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979		2,542.781 7	2,542.781 7	0.6126		2,555.646 2
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**		**2,542.781 7**	**2,542.781 7**	**0.6126**		**2,555.646 2**

3.6 Building Construction - 2021

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	0.5386	3.1355	7.6076	0.0148	0.4181	0.0551	0.4732	0.1193	0.0507	0.1699		1,381.670 5	1,381.670 5	0.0104		1,381.889 8
Worker	0.7467	0.9063	8.4151	0.0287	2.4069	0.0173	2.4243	0.6384	0.0161	0.6545		2,011.178 8	2,011.178 8	0.0944		2,013.162 1
Total	**1.2853**	**4.0417**	**16.0227**	**0.0434**	**2.8250**	**0.0724**	**2.8974**	**0.7577**	**0.0668**	**0.8245**		**3,392.849 3**	**3,392.849 3**	**0.1049**		**3,395.051 9**

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	1.8931	17.3403	16.5376	0.0268		0.9549	0.9549		0.8979	0.8979	0.0000	2,542.781 7	2,542.781 7	0.6126		2,555.646 2
Total	**1.8931**	**17.3403**	**16.5376**	**0.0268**		**0.9549**	**0.9549**		**0.8979**	**0.8979**	**0.0000**	**2,542.781 7**	**2,542.781 7**	**0.6126**		**2,555.646 2**

3.6 Building Construction - 2021

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	0.5386	3.1355	7.6076	0.0148	0.4181	0.0551	0.4732	0.1193	0.0507	0.1699		1,381.670 5	1,381.670 5	0.0104		1,381.889 8
Worker	0.7467	0.9063	8.4151	0.0287	2.4069	0.0173	2.4243	0.6384	0.0161	0.6545		2,011.178 8	2,011.178 8	0.0944		2,013.162 1
Total	**1.2853**	**4.0417**	**16.0227**	**0.0434**	**2.8250**	**0.0724**	**2.8974**	**0.7577**	**0.0668**	**0.8245**		**3,392.849 3**	**3,392.849 3**	**0.1049**		**3,395.051 9**

3.7 Paving - 2021

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	1.2308	12.6607	14.3528	0.0223		0.6652	0.6652		0.6120	0.6120		2,160.253 0	2,160.253 0	0.6987		2,174.925 0
Paving	9.8600e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2407**	**12.6607**	**14.3528**	**0.0223**		**0.6652**	**0.6652**		**0.6120**	**0.6120**		**2,160.253 0**	**2,160.253 0**	**0.6987**		**2,174.925 0**

3.7 Paving - 2021

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	0.0382	0.0464	0.4308	1.4700e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		102.9614	102.9614	4.8300e-003		103.0629
Total	**0.0382**	**0.0464**	**0.4308**	**1.4700e-003**	**0.1232**	**8.9000e-004**	**0.1241**	**0.0327**	**8.2000e-004**	**0.0335**		**102.9614**	**102.9614**	**4.8300e-003**		**103.0629**

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	1.2308	12.6607	14.3528	0.0223		0.6652	0.6652		0.6120	0.6120	0.0000	2,160.2530	2,160.2530	0.6987		2,174.9250
Paving	9.8600e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2407**	**12.6607**	**14.3528**	**0.0223**		**0.6652**	**0.6652**		**0.6120**	**0.6120**	**0.0000**	**2,160.2530**	**2,160.2530**	**0.6987**		**2,174.9250**

3.7 Paving - 2021

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	0.0382	0.0464	0.4308	1.4700e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		102.9614	102.9614	4.8300e-003		103.0629
Total	**0.0382**	**0.0464**	**0.4308**	**1.4700e-003**	**0.1232**	**8.9000e-004**	**0.1241**	**0.0327**	**8.2000e-004**	**0.0335**		**102.9614**	**102.9614**	**4.8300e-003**		**103.0629**

3.8 Architectural Coating - 2021

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	49.6146					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.8537
Total	**49.8335**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.8537**

3.8 Architectural Coating - 2021

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	0.1504	0.1825	1.6945	5.7700e-003	0.4847	3.4900e-003	0.4882	0.1286	3.2400e-003	0.1318		404.9814	404.9814	0.0190		405.3808
Total	**0.1504**	**0.1825**	**1.6945**	**5.7700e-003**	**0.4847**	**3.4900e-003**	**0.4882**	**0.1286**	**3.2400e-003**	**0.1318**		**404.9814**	**404.9814**	**0.0190**		**405.3808**

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	49.6146					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.8537
Total	**49.8335**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.8537**

3.8 Architectural Coating - 2021

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	0.1504	0.1825	1.6945	5.7700e-003	0.4847	3.4900e-003	0.4882	0.1286	3.2400e-003	0.1318		404.9814	404.9814	0.0190		405.3808
Total	**0.1504**	**0.1825**	**1.6945**	**5.7700e-003**	**0.4847**	**3.4900e-003**	**0.4882**	**0.1286**	**3.2400e-003**	**0.1318**		**404.9814**	**404.9814**	**0.0190**		**405.3808**

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	13.0771	23.8596	123.6794	0.3321	23.4405	0.3773	23.8179	6.2570	0.3483	6.6053		25,072.5592	25,072.5592	0.9588		25,092.6939
Unmitigated	13.0771	23.8596	123.6794	0.3321	23.4405	0.3773	23.8179	6.2570	0.3483	6.6053		25,072.5592	25,072.5592	0.9588		25,092.6939

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Condo/Townhouse	2,581.80	2,581.80	2581.80	6,358,684	6,358,684
Parking Lot	0.00	0.00	0.00		
Single Family Housing	1,916.49	1,916.49	1916.49	4,720,100	4,720,100
Strip Mall	0.00	0.00	0.00		
Total	4,498.29	4,498.29	4,498.29	11,078,785	11,078,785

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	7.88	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	7.88	7.30	7.50	41.60	18.80	39.60	86	11	3
Parking Lot	7.88	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	7.88	7.30	7.50	41.60	18.80	39.60	86	11	3
Strip Mall	7.88	7.30	7.30	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.512811	0.073496	0.191363	0.130940	0.036084	0.005147	0.012550	0.023118	0.001871	0.002053	0.006546	0.000576	0.003444

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable 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	lb/day										lb/day					
NaturalGas Mitigated	0.1685	1.4400	0.6137	9.1900e-003		0.1164	0.1164		0.1164	0.1164		1,838.0657	1,838.0657	0.0352	0.0337	1,849.2518
NaturalGas Unmitigated	0.2640	2.2559	0.9613	0.0144		0.1824	0.1824		0.1824	0.1824		2,879.6927	2,879.6927	0.0552	0.0528	2,897.2180

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					
Condo/Townhouse	9823.76	0.1059	0.9053	0.3853	5.7800e-003		0.0732	0.0732		0.0732	0.0732		1,155.7367	1,155.7367	0.0222	0.0212	1,162.7703
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	14622.3	0.1577	1.3475	0.5734	8.6000e-003		0.1090	0.1090		0.1090	0.1090		1,720.2655	1,720.2655	0.0330	0.0315	1,730.7347
Strip Mall	31.3699	3.4000e-004	3.0800e-003	2.5800e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004		3.6906	3.6906	7.0000e-005	7.0000e-005	3.7130
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.2640**	**2.2560**	**0.9613**	**0.0144**		**0.1824**	**0.1824**		**0.1824**	**0.1824**		**2,879.6927**	**2,879.6927**	**0.0552**	**0.0528**	**2,897.2180**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	9.31139	0.1004	0.8581	0.3652	5.4800e-003		0.0694	0.0694		0.0694	0.0694		1,095.4577	1,095.4577	0.0210	0.0201	1,102.1245
Strip Mall	0.0238082	2.6000e-004	2.3300e-003	1.9600e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004		2.8010	2.8010	5.0000e-005	5.0000e-005	2.8180
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	6.28836	0.0678	0.5795	0.2466	3.7000e-003		0.0469	0.0469		0.0469	0.0469		739.8070	739.8070	0.0142	0.0136	744.3093
Total		**0.1685**	**1.4400**	**0.6137**	**9.1900e-003**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**1,838.0657**	**1,838.0657**	**0.0352**	**0.0337**	**1,849.2518**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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	18.3058	0.4324	37.5028	1.9700e-003		0.7533	0.7533		0.7475	0.7475	0.0000	8,700.9528	8,700.9528	0.2307	0.1583	8,754.8658
Unmitigated	714.9581	9.8382	891.4925	0.3356		120.1929	120.1929		120.1894	120.1894	12,580.5940	5,343.4233	17,924.0174	11.6750	0.9896	18,475.9565

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	5.6565					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.8974					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	693.2689	9.4058	854.0329	0.3336		119.9864	119.9864		119.9829	119.9829	12,580.5940	5,276.1177	17,856.7117	11.6098	0.9896	18,407.2807
Landscaping	1.1353	0.4324	37.4597	1.9700e-003		0.2065	0.2065		0.2065	0.2065		67.3057	67.3057	0.0652		68.6758
Total	**714.9581**	**9.8382**	**891.4925**	**0.3356**		**120.1929**	**120.1929**		**120.1894**	**120.1894**	**12,580.5940**	**5,343.4233**	**17,924.0174**	**11.6750**	**0.9896**	**18,475.9565**

6.2 Area by SubCategory

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	1.4816					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.8974					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.7914	4.0000e-005	0.0432	0.0000		0.5468	0.5468		0.5410	0.5410	0.0000	8,633.6471	8,633.6471	0.1655	0.1583	8,686.1900
Landscaping	1.1353	0.4324	37.4597	1.9700e-003		0.2065	0.2065		0.2065	0.2065		67.3057	67.3057	0.0652		68.6758
Total	**18.3058**	**0.4324**	**37.5028**	**1.9700e-003**		**0.7533**	**0.7533**		**0.7475**	**0.7475**	**0.0000**	**8,700.9528**	**8,700.9528**	**0.2307**	**0.1583**	**8,754.8658**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

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
Generator Sets	2	8.00	260	84	0.74	Diesel

UnMitigated/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
Equipment Type	lb/day										lb/day					
Generator Sets	0.7148	6.3323	7.3694	0.0132		0.3355	0.3355		0.3355	0.3355		1,246.0691	1,246.0691	0.0636		1,247.4045
Total	**0.7148**	**6.3323**	**7.3694**	**0.0132**		**0.3355**	**0.3355**		**0.3355**	**0.3355**		**1,246.0691**	**1,246.0691**	**0.0636**		**1,247.4045**

10.0 Vegetation

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> HGVS

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.22	8.27	13.22	10.57	0.57	10.00	2.59	0.51	2.08	0.02	1,929.94	0.44	0.02	1,947.53
Grading/Excavation	6.50	48.98	71.74	13.40	3.40	10.00	5.17	3.09	2.08	0.09	8,846.84	2.47	0.09	8,934.21
Drainage/Utilities/Sub-Grade	5.64	42.89	56.71	12.93	2.93	10.00	4.80	2.72	2.08	0.07	7,241.41	1.61	0.07	7,302.26
Paving	2.22	19.03	20.79	1.32	1.32	0.00	1.19	1.19	0.00	0.03	3,128.22	0.75	0.03	3,157.24
Maximum (pounds/day)	6.50	48.98	71.74	13.40	3.40	10.00	5.17	3.09	2.08	0.09	8,846.84	2.47	0.09	8,934.21
Total (tons/construction project)	0.33	2.53	3.50	0.74	0.17	0.56	0.28	0.16	0.12	0.00	444.54	0.11	0.00	448.66

Notes:

Project Start Year ->	2018
Project Length (months) ->	6
Total Project Area (acres) ->	13
Maximum Area Disturbed/Day (acres) ->	1
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	320	40
Grading/Excavation	0	0	0	0	800	40
Drainage/Utilities/Sub-Grade	0	0	0	0	720	40
Paving	0	0	0	0	560	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> HGVS

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.05	0.09	0.07	0.00	0.07	0.02	0.00	0.01	0.00	12.74	0.00	0.00	11.66
Grading/Excavation	0.17	1.29	1.89	0.35	0.09	0.26	0.14	0.08	0.05	0.00	233.56	0.07	0.00	213.97
Drainage/Utilities/Sub-Grade	0.13	0.99	1.31	0.30	0.07	0.23	0.11	0.06	0.05	0.00	167.28	0.04	0.00	153.03
Paving	0.02	0.19	0.21	0.01	0.01	0.00	0.01	0.01	0.00	0.00	30.97	0.01	0.00	28.36
Maximum (tons/phase)	0.17	1.29	1.89	0.35	0.09	0.26	0.14	0.08	0.05	0.00	233.56	0.07	0.00	213.97
Total (tons/construction project)	0.33	2.53	3.50	0.74	0.17	0.56	0.28	0.16	0.12	0.00	444.54	0.11	0.00	407.02

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model **Version 8.1.0**

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	HGVS	
Construction Start Year	2018	Enter a Year between 2014 and 2025 (inclusive)
Project Type	1	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	6.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	1.80	miles
Total Project Area	13.00	acres
Maximum Area Disturbed/Day	1.00	acre
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing		0.60		1/1/2018
Grading/Excavation		2.40		1/20/2018
Drainage/Utilities/Sub-Grade		2.10		4/3/2018
Paving		0.90		6/6/2018
Totals (Months)	6			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		0	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
User Input				
Miles/ one-way trip		20		
One-way trips/day		2		
No. of employees: Grubbing/Land Clearing		8	16	320.00
No. of employees: Grading/Excavation		20	40	800.00
No. of employees: Drainage/Utilities/Sub-Grade		18	36	720.00
No. of employees: Paving		14	28	560.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Grading/Excavation (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Draining/Utilities/Sub-Grade (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Paving (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Grubbing/Land Clearing (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Grading/Excavation (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Draining/Utilities/Sub-Grade (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Paving (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.06	1.05	0.11	0.03	0.01	0.00	280.94	0.01	0.00	282.53
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	1.85	0.00	0.00	1.86
Pounds per day - Grading/Excavation	0.15	2.62	0.28	0.08	0.03	0.01	702.34	0.02	0.01	706.33
Tons per const. Period - Grading/Excavation	0.00	0.07	0.01	0.00	0.00	0.00	18.54	0.00	0.00	18.65
Pounds per day - Drainage/Utilities/Sub-Grade	0.14	2.36	0.25	0.07	0.03	0.01	632.11	0.02	0.01	635.69
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.05	0.01	0.00	0.00	0.00	14.60	0.00	0.00	14.68
Pounds per day - Paving	0.11	1.84	0.20	0.06	0.02	0.00	491.64	0.01	0.01	494.43
Tons per const. Period - Paving	0.00	0.02	0.00	0.00	0.00	0.00	4.87	0.00	0.00	4.89
Total tons per construction project	0.01	0.15	0.02	0.00	0.00	0.00	39.86	0.00	0.00	40.09

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT
User Input					
Grubbing/Land Clearing - Exhaust		1		40.00	40.00
Grading/Excavation - Exhaust		1		40.00	40.00
Drainage/Utilities/Subgrade		1		40.00	40.00
Paving		1		40.00	40.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.93
Pounds per day - Grading/Excavation	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	3.74
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	3.24	0.00	0.00	3.27
Pounds per day - Paving	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.00	0.00	1.40
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	9.26	0.00	0.00	9.35

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		1.00	10.00	0.07	2.08	0.01
Fugitive Dust - Grading/Excavation		1.00	10.00	0.26	2.08	0.05
Fugitive Dust - Drainage/Utilities/Subgrade		1.00	10.00	0.23	2.08	0.05

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Crawler Tractors	0.63	2.61	8.34	0.32	0.29	0.01	775.49	0.24	0.01	783.53
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Excavators	0.30	3.38	3.19	0.15	0.14	0.01	536.03	0.17	0.00	541.59
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	1.16	7.19	12.98	0.53	0.49	0.02	1,508.77	0.43	0.01	1,523.38
Grubbing/Land Clearing	tons per phase	0.01	0.05	0.09	0.00	0.00	0.00	9.96	0.00	0.00	10.05

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0		Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Crawler Tractors	0.63	2.61	8.34	0.32	0.29	0.01	775.49	0.24	0.01	783.53
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Excavators	0.90	10.14	9.58	0.46	0.43	0.02	1,608.08	0.50	0.01	1,624.78
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Graders	0.84	4.69	8.36	0.47	0.43	0.01	629.41	0.20	0.01	635.92
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Rollers	0.52	3.92	5.05	0.35	0.32	0.01	534.41	0.17	0.00	539.95
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Rubber Tired Loaders	0.42	1.71	5.25	0.18	0.16	0.01	619.57	0.19	0.01	626.01
	2		Model Default Tier	Scrapers	2.26	17.33	28.00	1.10	1.01	0.03	3,008.05	0.94	0.03	3,039.27
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Tractors/Loaders/Backhoes	0.54	4.72	5.31	0.38	0.35	0.01	632.00	0.20	0.01	638.55
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	6.34	46.33	71.33	3.31	3.05	0.08	8,004.27	2.45	0.07	8,086.26
Grading/Excavation	tons per phase	0.17	1.22	1.88	0.09	0.08	0.00	211.31	0.06	0.00	213.48

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Air Compressors	0.40	2.47	2.67	0.20	0.20	0.00	375.27	0.04	0.00	377.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Generator Sets	0.51	3.75	4.11	0.26	0.26	0.01	623.04	0.04	0.00	625.56
	1		Model Default Tier	Graders	0.84	4.69	8.36	0.47	0.43	0.01	629.41	0.20	0.01	635.92
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00	34.65
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Pumps	0.53	3.81	4.17	0.28	0.28	0.01	623.04	0.05	0.00	625.61
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Rough Terrain Forklifts	0.16	2.31	2.01	0.10	0.09	0.00	346.54	0.11	0.00	350.13
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Scrapers	2.26	17.33	28.00	1.10	1.01	0.03	3,008.05	0.94	0.03	3,039.27
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Tractors/Loaders/Backhoes	0.54	4.72	5.31	0.38	0.35	0.01	632.00	0.20	0.01	638.55
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	5.50	40.50	56.33	2.85	2.69	0.07	6,469.07	1.59	0.05	6,524.95
Drainage/Utilities/Sub-Grade	tons per phase	0.13	0.94	1.30	0.07	0.06	0.00	149.44	0.04	0.00	150.73

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Pavers	0.32	2.84	3.50	0.17	0.16	0.00	458.58	0.14	0.00	463.33
	1		Model Default Tier	Paving Equipment	0.24	2.52	2.64	0.13	0.12	0.00	406.90	0.13	0.00	411.13
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Rollers	0.78	5.88	7.57	0.52	0.48	0.01	801.62	0.25	0.01	809.93
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Tractors/Loaders/Backhoes	0.54	4.72	5.31	0.38	0.35	0.01	632.00	0.20	0.01	638.55
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Paving	pounds per day	2.10	17.16	20.46	1.25	1.16	0.03	2,496.35	0.74	0.02	2,521.19
	Paving	tons per phase	0.02	0.17	0.20	0.01	0.01	0.00	24.71	0.01	0.00	24.96
Total Emissions all Phases (tons per construction period) =>			0.32	2.38	3.47	0.17	0.16	0.00	395.42	0.11	0.00	399.22

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

Drilling and Blasting

			Blast Frequency				
ID	Source	holes/blast	blasts/day	blasts/month	blasts/ year	Tons ANFO/ Blast
B-1	Blasting Activity	100	1	12	36	1.25

Notes
400 sf area of drilling
1,200 lbs (0.6 tons) rock material

Dust - PM10

								PM10 Emissions			PM2.5 Emissions			Source Type
ID	Source	Area (ft2)	PM10 EF Drilling (lb/hole)	PM2.5 EF Drilling (lb/hole)	Drilling Control Efficiency	PM10 EF Blasting (lb/blast)	PM2.5 EF Blasting (lb/blast)	lb/hr	lb/day	TPY	lb/hr	lb/day	TPY	
B-1	Blasting	22,500	-	-	-	24.57	1.4175	24.57	24.57	0.44226	1.4175	1.4175	0.025515	Area
D-1	Drilling	22,500	0.65	0.12	75%	-	-	0.1625	16.25	0.2925	0.03	3	0.054	Area
							Total	24.73	40.82	0.73	1.45	4.42	0.08	

Notes:
1. Emissions Factor Source: AP-42 5th Edition, Section 11.9, Table 11.9-4, October 1998. Assumes PM10 = TSP/2 = 1.3 lbs/hole / 2 = 0.65 lb/hole.
2. Emissions factor for PM2.5 is calculated based on a similar mechanical process for aggreagte roock crushing. The emission factors for tertiary rock crushing will be used, based on AP-42 11.19.2, Table 11.19.2-2, Final Section, updated August 2004. The tertiary crushing emission factor for PM10 is 0.00054 lb/ton and the emissions factor for PM2.5 us 0.00010 lb/ton. The ratio of PM2.5 to PM10 is 0.00010/0.00054 = 0.185. Since the PM10 emission factor is estimated to be 0.65 lb/hole (see note 1), the emission factor for PM2.5 is estimated to be 0.65 lb/hole x 0.185 = 0.12 lb/hole.
3. Control Efficiency estimated to be between 63% and 88%, based on drill rotoclone or similar dust shroud device. Assumed midpoint of range reported.
4. AP-42 5th Edition, Section 11.9, Table 11.9-1. Also referenced Appendix E.2 of Background document to AP-42 5th Edition, Section 11.9.
PM10 EF = $0.000014(A)^{1.5}(0.52)$, where A = horizontal area in ft2 with a scaling factor for $\leq$10um of 0.52
PM2.5 EF = $0.000014(A)^{1.5}(0.03)$, where A = horizontal area in ft2 with a scaling factor for $\leq$2.5um of 0.03
Drill goes up to 20 feet deep for 12 holes. Up to 240 ft/day drilling.

Blasting Gases - ANFO Emission Factors

ID	Source	CO EF lb/ton	NOX EF lb/ton	SOx EF lb/ton	CO2 EF lb/ton	CH4 EF lb/ton	N2O EF lb/ton
B-1	Blasting Activity	67	17	2	566	0.02	0.005

Blasting Gases - ANFO Emission Rates Criteria Pollutants

ID	Emissions	CO (lb/hr)	CO (lb/day)	CO (TPY)	NOx (lb/hr)	NOx (lb/day)	NOx (TPY)	SOx (lb/hr)	SOx (lb/day)	SOx (TPY)	Source Type
B-1	Blasting Activity	83.75	83.75	1.51	21.25	21.25	0.38	2.50	2.50	0.05	Area

Notes:
1. Emission Factor Source: AP-42 5th Edition, Section 13.3, Table 13.3-1, February 1980, ND = no data.

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: VALLEY PKWY AND I15 NB RAMPS AMWP
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (M)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 5. DEGREES	TEMP= 15.6 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NF	2	-450	2	-150	AG	321	1.5	.0	10.5
B. NA	2	-150	2	0	AG	250	2.7	.0	9.9
C. ND	2	0	2	150	AG	461	2.1	.0	9.9
D. NE	2	150	2	450	AG	461	1.5	.0	10.5
E. SF	-2	450	-2	150	AG	1125	1.5	.0	10.5
F. SA	-2	150	-2	0	AG	772	3.1	.0	9.9
G. SD	-2	0	-2	-150	AG	413	1.9	.0	9.9
H. SE	-2	-150	-2	-450	AG	413	1.5	.0	10.5
I. WF	450	2	150	2	AG	1428	1.5	.0	10.5
J. WA	150	2	0	2	AG	1228	3.0	.0	9.9
K. WD	0	2	-150	2	AG	1681	2.1	.0	9.9
L. WE	-150	2	-450	2	AG	1681	1.5	.0	10.5
M. EF	-450	-2	-150	-2	AG	1097	1.5	.0	10.5
N. EA	-150	-2	0	-2	AG	986	3.0	.0	9.9
O. ED	0	-2	150	-2	AG	1416	2.1	.0	9.9
P. EE	150	-2	450	-2	AG	1416	1.5	.0	10.5
Q. NL	0	0	2	-150	AG	71	2.7	.0	9.9
R. SL	0	0	-2	150	AG	353	2.9	.0	9.9
S. WL	0	0	150	2	AG	200	2.1	.0	9.9
T. EL	0	0	-150	-2	AG	111	2.1	.0	9.9

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE3	8	8	1.8
2. SE3	8	-8	1.8
3. SW3	-8	-8	1.8
4. NW3	-8	8	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. NE3	265.	1.4	.0	.0	.0	.0	.0	.1	.0	.0
2. SE3	275.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
3. SW3	85.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
4. NW3	95.	1.5	.0	.0	.0	.0	.0	.2	.0	.0

CONC/LINK (PPM)

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T
1. NE3	.0	.0	.6	.0	.0	.3	.0	.0	.0	.0	.0	.0
2. SE3	.0	.0	.3	.0	.0	.6	.0	.0	.0	.0	.0	.0
3. SW3	.0	.3	.0	.0	.0	.0	.5	.0	.0	.0	.0	.0
4. NW3	.0	.7	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: VALLEY PKWY AND I15 NB RAMPS PMWP
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (M)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 5. DEGREES	TEMP= 15.6 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NF	2	-450	2	-150	AG	489	1.5	.0	10.5
B. NA	2	-150	2	0	AG	400	3.1	.0	9.9
C. ND	2	0	2	150	AG	582	3.0	.0	9.9
D. NE	2	150	2	450	AG	582	1.5	.0	10.5
E. SF	-2	450	-2	150	AG	837	1.5	.0	10.5
F. SA	-2	150	-2	0	AG	576	3.1	.0	9.9
G. SD	-2	0	-2	-150	AG	541	2.7	.0	9.9
H. SE	-2	-150	-2	-450	AG	541	1.5	.0	10.5
I. WF	450	2	150	2	AG	1523	1.5	.0	10.5
J. WA	150	2	0	2	AG	1253	2.8	.0	9.9
K. WD	0	2	-150	2	AG	1358	1.8	.0	9.9
L. WE	-150	2	-450	2	AG	1358	1.5	.0	10.5
M. EF	-450	-2	-150	-2	AG	1828	1.5	.0	10.5
N. EA	-150	-2	0	-2	AG	1726	2.8	.0	9.9
O. ED	0	-2	150	-2	AG	2196	1.8	.0	9.9
P. EE	150	-2	450	-2	AG	2196	1.5	.0	10.5
Q. NL	0	0	2	-150	AG	89	2.8	.0	9.9
R. SL	0	0	-2	150	AG	261	2.9	.0	9.9
S. WL	0	0	150	2	AG	270	2.1	.0	9.9
T. EL	0	0	-150	-2	AG	102	2.0	.0	9.9

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE3	8	8	1.8
2. SE3	8	-8	1.8
3. SW3	-8	-8	1.8
4. NW3	-8	8	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. NE3	265.	1.4	.0	.0	.1	.0	.0	.0	.0	.0
2. SE3	275.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
3. SW3	85.	1.5	.0	.0	.0	.0	.0	.0	.1	.0
4. NW3	95.	1.5	.0	.0	.0	.0	.0	.1	.0	.0

CONC/LINK (PPM)

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T
1. NE3	.0	.0	.5	.0	.0	.4	.0	.0	.0	.0	.0	.0
2. SE3	.0	.0	.2	.0	.0	.8	.1	.0	.0	.0	.0	.0
3. SW3	.0	.3	.0	.0	.0	.1	.7	.0	.0	.0	.0	.0
4. NW3	.0	.7	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: COUNTRY CLUB DR AND HARMONY GROVE AMWP
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (M)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 5. DEGREES	TEMP= 15.6 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NF	2	-450	2	-150	AG	302	1.5	.0	10.5
B. NA	2	-150	2	0	AG	271	2.7	.0	9.9
C. ND	2	0	2	150	AG	190	1.8	.0	9.9
D. NE	2	150	2	450	AG	190	1.5	.0	10.5
E. SF	-2	450	-2	150	AG	240	1.5	.0	10.5
F. SA	-2	150	-2	0	AG	235	2.6	.0	9.9
G. SD	-2	0	-2	-150	AG	138	1.8	.0	9.9
H. SE	-2	-150	-2	-450	AG	138	1.5	.0	10.5
I. WF	450	2	150	2	AG	521	1.5	.0	10.5
J. WA	150	2	0	2	AG	436	2.2	.0	9.9
K. WD	0	2	-150	2	AG	663	1.7	.0	9.9
L. WE	-150	2	-450	2	AG	663	1.5	.0	10.5
M. EF	-450	-2	-150	-2	AG	394	1.5	.0	10.5
N. EA	-150	-2	0	-2	AG	279	2.2	.0	9.9
O. ED	0	-2	150	-2	AG	466	1.7	.0	9.9
P. EE	150	-2	450	-2	AG	466	1.5	.0	10.5
Q. NL	0	0	2	-150	AG	31	2.6	.0	9.9
R. SL	0	0	-2	150	AG	5	2.6	.0	9.9
S. WL	0	0	150	2	AG	85	2.1	.0	9.9
T. EL	0	0	-150	-2	AG	115	2.1	.0	9.9

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE3	8	8	1.8
2. SE3	8	-8	1.8
3. SW3	-8	-8	1.8
4. NW3	-8	8	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. NE3	266.	.5	.0	.0	.0	.0	.0	.0	.0	.0
2. SE3	274.	.4	.0	.0	.0	.0	.0	.0	.0	.0
3. SW3	86.	.4	.0	.0	.0	.0	.0	.0	.0	.0
4. NW3	94.	.5	.0	.0	.0	.0	.0	.0	.0	.0

CONC/LINK (PPM)

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T
1. NE3	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. SE3	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0
3. SW3	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0
4. NW3	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: COUNTRY CLUB DR AND HARMONY GROVE PMWP
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (M)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= .0 PPM	
SIGTH= 5. DEGREES	TEMP= 15.6 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NF	2	-450	2	-150	AG	170	1.5	.0	10.5
B. NA	2	-150	2	0	AG	154	2.9	.0	9.9
C. ND	2	0	2	150	AG	234	1.9	.0	9.9
D. NE	2	150	2	450	AG	234	1.5	.0	10.5
E. SF	-2	450	-2	150	AG	276	1.5	.0	10.5
F. SA	-2	150	-2	0	AG	266	3.0	.0	9.9
G. SD	-2	0	-2	-150	AG	370	2.5	.0	9.9
H. SE	-2	-150	-2	-450	AG	370	1.5	.0	10.5
I. WF	450	2	150	2	AG	546	1.5	.0	10.5
J. WA	150	2	0	2	AG	300	2.1	.0	9.9
K. WD	0	2	-150	2	AG	483	1.7	.0	9.9
L. WE	-150	2	-450	2	AG	483	1.5	.0	10.5
M. EF	-450	-2	-150	-2	AG	789	1.5	.0	10.5
N. EA	-150	-2	0	-2	AG	605	2.2	.0	9.9
O. ED	0	-2	150	-2	AG	694	1.7	.0	9.9
P. EE	150	-2	450	-2	AG	694	1.5	.0	10.5
Q. NL	0	0	2	-150	AG	16	2.9	.0	9.9
R. SL	0	0	-2	150	AG	10	2.9	.0	9.9
S. WL	0	0	150	2	AG	246	2.0	.0	9.9
T. EL	0	0	-150	-2	AG	184	2.0	.0	9.9

(LINK COORDINATES (M): X1, Y1, X2, Y2)

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE3	8	8	1.8
2. SE3	8	-8	1.8
3. SW3	-8	-8	1.8
4. NW3	-8	8	1.8

(COORDINATES (M))

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. NE3	265.	.5	.0	.0	.0	.0	.0	.0	.0	.0
2. SE3	274.	.6	.0	.0	.0	.0	.0	.0	.0	.0
3. SW3	86.	.6	.0	.0	.0	.0	.0	.0	.0	.0
4. NW3	94.	.5	.0	.0	.0	.0	.0	.0	.0	.0

(CONC/LINK (PPM): A–H)

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T
1. NE3	.0	.0	.2	.0	.0	.1	.0	.0	.0	.0	.0	.0
2. SE3	.0	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0
3. SW3	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0
4. NW3	.0	.1	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0

(CONC/LINK (PPM): I–T)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: HARMONY GROVE RD AND KAUANA LOA AMWP
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

```
     U=    .5 M/S             Z0= 100. CM            ALT=     0. (M)
   BRG= WORST CASE            VD=    .0 CM/S
  CLAS=     7 (G)             VS=    .0 CM/S
  MIXH= 1000. M              AMB=    .0 PPM
 SIGTH=    5. DEGREES       TEMP= 15.6 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NF	2	-450	2	-150	AG	405	1.5	.0	10.5
B. NA	2	-150	2	0	AG	368	2.9	.0	9.9
C. ND	2	0	2	150	AG	0	1.8	.0	9.9
D. NE	2	150	2	450	AG	0	1.5	.0	10.5
E. SF	-2	450	-2	150	AG	0	1.5	.0	10.5
F. SA	-2	150	-2	0	AG	0	2.7	.0	9.9
G. SD	-2	0	-2	-150	AG	552	2.6	.0	9.9
H. SE	-2	-150	-2	-450	AG	552	1.5	.0	10.5
I. WF	450	2	150	2	AG	623	1.5	.0	10.5
J. WA	150	2	0	2	AG	94	2.1	.0	9.9
K. WD	0	2	-150	2	AG	131	1.6	.0	9.9
L. WE	-150	2	-450	2	AG	131	1.5	.0	10.5
M. EF	-450	-2	-150	-2	AG	158	1.5	.0	10.5
N. EA	-150	-2	0	-2	AG	158	2.1	.0	9.9
O. ED	0	-2	150	-2	AG	503	1.7	.0	9.9
P. EE	150	-2	450	-2	AG	503	1.5	.0	10.5
Q. NL	0	0	2	-150	AG	37	2.7	.0	9.9
R. SL	0	0	-2	150	AG	0	2.7	.0	9.9
S. WL	0	0	150	2	AG	529	2.2	.0	9.9
T. EL	0	0	-150	-2	AG	0	2.1	.0	9.9

(LINK COORDINATES (M) span X1, Y1, X2, Y2)

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE3	8	8	1.8
2. SE3	8	-8	1.8
3. SW3	-8	-8	1.8
4. NW3	-8	8	1.8

(COORDINATES (M) span X, Y, Z)

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. NE3	185.	.6	.0	.2	.0	.0	.0	.0	.1	.0
2. SE3	185.	.5	.0	.3	.0	.0	.0	.0	.1	.0
3. SW3	85.	.6	.0	.0	.0	.0	.0	.0	.1	.0
4. NW3	176.	.5	.0	.1	.0	.0	.0	.0	.3	.0

(CONC/LINK (PPM) spans A–H)

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T
1. NE3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. SE3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. SW3	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.2	.0
4. NW3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

(CONC/LINK (PPM) spans I–T)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: HARMONY GROVE RD AND KAUANA LOA PMWP
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= 15.6 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NF	2	-450	2	-150	AG	680	1.5	.0	10.5
B. NA	2	-150	2	0	AG	647	2.8	.0	9.9
C. ND	2	0	2	150	AG	0	1.7	.0	9.9
D. NE	2	150	2	450	AG	0	1.5	.0	10.5
E. SF	-2	450	-2	150	AG	0	1.5	.0	10.5
F. SA	-2	150	-2	0	AG	0	2.4	.0	9.9
G. SD	-2	0	-2	-150	AG	490	1.8	.0	9.9
H. SE	-2	-150	-2	-450	AG	490	1.5	.0	10.5
I. WF	450	2	150	2	AG	592	1.5	.0	10.5
J. WA	150	2	0	2	AG	152	2.4	.0	9.9
K. WD	0	2	-150	2	AG	185	1.7	.0	9.9
L. WE	-150	2	-450	2	AG	185	1.5	.0	10.5
M. EF	-450	-2	-150	-2	AG	129	1.5	.0	10.5
N. EA	-150	-2	0	-2	AG	129	2.4	.0	9.9
O. ED	0	-2	150	-2	AG	726	1.9	.0	9.9
P. EE	150	-2	450	-2	AG	726	1.5	.0	10.5
Q. NL	0	0	2	-150	AG	33	2.4	.0	9.9
R. SL	0	0	-2	150	AG	0	2.4	.0	9.9
S. WL	0	0	150	2	AG	440	2.5	.0	9.9
T. EL	0	0	-150	-2	AG	0	2.4	.0	9.9

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. NE3	8	8	1.8
2. SE3	8	-8	1.8
3. SW3	-8	-8	1.8
4. NW3	-8	8	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. NE3	184.	.7	.0	.4	.0	.0	.0	.0	.0	.0
2. SE3	85.	.6	.0	.0	.0	.0	.0	.0	.0	.0
3. SW3	85.	.7	.0	.0	.0	.0	.0	.0	.0	.0
4. NW3	175.	.5	.0	.2	.0	.0	.0	.0	.2	.0

CONC/LINK (PPM)

RECEPTOR	I	J	K	L	M	N	O	P	Q	R	S	T
1. NE3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. SE3	.0	.0	.0	.0	.0	.0	.3	.0	.0	.0	.1	.0
3. SW3	.0	.0	.0	.0	.0	.0	.3	.0	.0	.0	.2	.0
4. NW3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

Appendix B

HEALTH RISK ASSESSMENT

Screening HRA Heath Risk Inputs and Calculations for Project-related Construction DPM

1 24 hrs/24 hrs

*assume all PM10 exhaust is DPM

*assumption is that emissions are constant over the acres disturbed

Emission Calcs	
6.61	Highest Unmitgated On-Site Exhaust PM10 emissions in Lbs/day
453.6	grams/pound
3600	seconds/hour
24	hours/day
100%	percent of day
365.25	days/yr
9.50103E-05	grams/second

Area Calcs	
75.67	Max area disturbed (acres)
4046.825	meters2/acre
306223.2478	meters2
553.3744191	meters x meters

Screen 3 assumptions
1.5 m receptor height
3.0 m stack height
use discrete distances as well as array from 0 to 5,000 m
rural setting

SCREEN3 Emission Rate

3.10265E-10 grams/second*meter2

0.00000000031 value inserted in SCREEN3 model

0.3048 conversion factor from ft to m

ft	m	SCREEN3 Distances	
10.00	3.05	receptor 1	* project boundary
328.08	100.00	receptor 2	* 100 meter (328 ft) from project boundary
984.25	300.00	receptor 3	* 300 meter (984 ft) from project boundary
1,312.34	400.00	receptor 4	* 400 meter (1,312 ft) from project boundary
1,640.42	500.00	receptor 5	* 500 meter (1,640 ft) from project boundary
1,968.50	600.00	receptor 6	* 600 meter (1,968ft) from project boundary
1,315.62	401.00	highest concentration	* highest receptor location

0.3048 conversion factor from ft to m

Highest Concentration (401 m)

	HRA Calcs		
0.02485	SCREEN3 1-hour concentration (micrograms/meter3)	Value obtained from SCREEN3 output file	
0.1	1-hour --> annual conversion	From June 2007 BAAQMD PERMIT MODELING GUIDANCE, pg. 4	
2.49E-03	SCREEN3 annual concentration (micrograms/meter3)		
3.05E-08	Calculated dose (mg/kg-day)		
0.034	Cancer risk (per million)		
0.00050	Hazard Index		
5	Chronic inhallation REL (micrograms/meter3)		
365	days of construction		
100%	(% of day)		
260	Exposure frequency (EF)	days/year	*# of construction days*
4	Exposure duration (ED)	Years	*# of days/365*
25550	Averaging time (AT)	days	
302	Daily breathing rate (DBR)	L/kg body weight	
1	Inhalation absorption factor (A)	None	
1.00E-03	Micrograms to milligrams conversion	1 microgram	
1.00E-03	liters to cubic meters conversion	liters	
1.1	Cancer potency factor	mg/kg-day	
1.00E+06	risk per million people	None	

Project Boundary

10 feet (3m)

	HRA Calcs	
0.01507	SCREEN3 1-hour concentration (micrograms/meter3)	Value obtained from SCREEN3 output file
0.1	1-hour --> 24-hr conversion	
1.51E-03	SCREEN3 24-hour concentration (micrograms/meter3)	
1.85E-08	Calculated dose (mg/kg-day)	
0.020	Cancer risk (per million)	
0.00030	Hazard Index	

328 feet (100m)

	HRA Calcs	
0.01800	SCREEN3 1-hour concentration (micrograms/meter3)	Value obtained from SCREEN3 output file
0.1	1-hour --> 24-hr conversion	
1.80E-03	SCREEN3 24-hour concentration (micrograms/meter3)	
2.21E-08	Calculated dose (mg/kg-day)	
0.024	Cancer risk (per million)	
0.00036	Hazard Index	

984 feet (300m)

	HRA Calcs	
0.02328	SCREEN3 1-hour concentration (micrograms/meter3)	Value obtained from SCREEN3 output file
0.1	1-hour --> 24-hr conversion	
2.33E-03	SCREEN3 24-hour concentration (micrograms/meter3)	
2.86E-08	Calculated dose (mg/kg-day)	
0.031	Cancer risk (per million)	
0.00047	Hazard Index	

1,312 feet (400m)

	HRA Calcs	
0.02484	SCREEN3 1-hour concentration (micrograms/meter3)	Value obtained from SCREEN3 output file
0.1	1-hour --> 24-hr conversion	
2.48E-03	SCREEN3 24-hour concentration (micrograms/meter3)	
3.05E-08	Calculated dose (mg/kg-day)	
0.034	Cancer risk (per million)	
0.00050	Hazard Index	

1,640 feet (500m)

	HRA Calcs	
0.02187	SCREEN3 1-hour concentration (micrograms/meter3)	Value obtained from SCREEN3 output file
0.1	1-hour --> 24-hr conversion	
2.19E-03	SCREEN3 24-hour concentration (micrograms/meter3)	
2.69E-08	Calculated dose (mg/kg-day)	
0.030	Cancer risk (per million)	
0.00044	Hazard Index	

1,968 feet (600m)

	HRA Calcs	
0.01888	SCREEN3 1-hour concentration (micrograms/meter3)	Value obtained from SCREEN3 output file
0.1	1-hour --> 24-hr conversion	
1.89E-03	SCREEN3 24-hour concentration (micrograms/meter3)	
2.32E-08	Calculated dose (mg/kg-day)	
0.026	Cancer risk (per million)	
0.00038	Hazard Index	

02/05/15

08:00:54
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

HGVS Construction HRA.scr

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.310265E-09
SOURCE HEIGHT (M) = 3.0000
LENGTH OF LARGER SIDE (M) = 533.0000
LENGTH OF SMALLER SIDE (M) = 533.0000
RECEPTOR HEIGHT (M) = 1.5000
URBAN/RURAL OPTION = RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
100.	0.1800E-01	6	1.0	1.0	10000.0	3.00	44.
200.	0.2081E-01	6	1.0	1.0	10000.0	3.00	45.
300.	0.2328E-01	6	1.0	1.0	10000.0	3.00	45.
400.	0.2484E-01	6	1.0	1.0	10000.0	3.00	45.
500.	0.2187E-01	6	1.0	1.0	10000.0	3.00	45.
600.	0.1888E-01	6	1.0	1.0	10000.0	3.00	45.
700.	0.1660E-01	6	1.0	1.0	10000.0	3.00	45.
800.	0.1486E-01	6	1.0	1.0	10000.0	3.00	45.
900.	0.1352E-01	6	1.0	1.0	10000.0	3.00	45.
1000.	0.1246E-01	6	1.0	1.0	10000.0	3.00	45.
1100.	0.1160E-01	6	1.0	1.0	10000.0	3.00	45.
1200.	0.1087E-01	6	1.0	1.0	10000.0	3.00	45.
1300.	0.1025E-01	6	1.0	1.0	10000.0	3.00	45.

```
  1400.  0.9710E-02    6     1.0    1.0 10000.0    3.00     45.
  1500.  0.9230E-02    6     1.0    1.0 10000.0    3.00     45.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND   100. M:
   401.  0.2485E-01    6     1.0    1.0 10000.0    3.00     45.

*********************************
*** SCREEN DISCRETE DISTANCES ***
*********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR
FOLLOWING DISTANCES ***

   DIST     CONC             U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   (DEG)
 -------  ----------  ----  -----  -----  ------  ------  -------
      3.  0.1507E-01    6     1.0    1.0 10000.0    3.00     45.

      ***************************************
      *** SUMMARY OF SCREEN MODEL RESULTS ***
      ***************************************

 CALCULATION          MAX CONC    DIST TO   TERRAIN
  PROCEDURE          (UG/M**3)    MAX (M)    HT (M)
--------------     -----------    -------   -------
SIMPLE TERRAIN      0.2485E-01      401.        0.


 ***************************************************
 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
 ***************************************************
```

VOC Emissions from Influent Treatment

Peak Daily Influent Flow (gal/day)	180,000
Average Influent Flow (gal/day)	72,000
Conversion Factor from μg/L and MGD to lb/yr	3.04
Annual x/Q from SCREEN3 modeling (1-hour x/Q x 0.1)	27.11
Max 24-hr x/Q (1-hr x/Q * 0.4)	108.44

						Annual Average Ambient Concs.		24-Hr Average Ambient Concs.		Carcinogenic Risk		Non-Cancer Risk			
Compound	Risk Assessment Averaging Period	Toxic Influent Concentration (μg/L)	Peak Daily Emissions (lbs/day)	Annual Average Emissions (lbs/year)	Emission Rate (g/s)	SCREEN3 Dispersion factor (ug/m3) / (g/s)	Annual Ambient Conc. (μg/m3)	SCREEN3 Dispersion factor (ug/m3) / (g/s)	24-hr Ambient Conc. (μg/m3)	Cancer Potency Factor	Cancer Risk	Chronic Inhalation REL	Chronic Non-Cancer Risk	Acute Inhalation REL	24-hr (Acute) Non-Cancer Risk
Ammonia	Annual, 24-hr	299.5	4.498E-05	0.00656773	5.20653E-10	2.71E+01	1.41E-08	1.08E+02	5.65E-08			200	7.06E-11	3200	1.76E-11
Benzene	Annual, 24-hr	0.58	8.712E-08	1.2719E-05	1.00828E-12	2.71E+01	2.73E-11	1.08E+02	1.09E-10	1.00E-01	8.25E-10	3	9.11E-12	27	4.05E-12
Chloroform	Annual, 24-hr	8.1	1.217E-06	0.00017762	1.40811E-11	2.71E+01	3.82E-10	1.08E+02	1.53E-09	1.90E-02	2.19E-09	300	1.27E-12	150	1.02E-11
Ethyl Benzene	Annual	2.25	3.379E-07	4.934E-05	3.91142E-12	2.71E+01	1.06E-10	1.08E+02	4.24E-10	8.70E-03	2.79E-10	2000	5.30E-14		
Hydrogen Sulfide	Annual, 24-hr	19.5	2.929E-06	0.00042761	3.38989E-11	2.71E+01	9.19E-10	1.08E+02	3.68E-09			10	9.19E-11	42	8.75E-11
1,1,1-TCA	Annual	2.65	3.980E-07	5.8112E-05	4.60678E-12	2.71E+01	1.25E-10	1.08E+02	5.00E-10			1000	1.25E-13	68000	7.35E-15
Methylene Chlorine	Annual, 24-hr	7.8	1.172E-06	0.00017105	1.35596E-11	2.71E+01	3.68E-10	1.08E+02	1.47E-09	3.50E-03	3.89E-10	400	9.19E-13	14000	1.05E-13
1,4-Dichlorobenzene	Annual	4.65	6.984E-07	0.00010197	8.0836E-12	2.71E+01	2.19E-10	1.08E+02	8.77E-10	4.00E-02	2.65E-09	800	2.74E-13		
Phenol	Annual, 24-hr	9.8	1.472E-06	0.0002149	1.70364E-11	2.71E+01	4.62E-10	1.08E+02	1.85E-09			200	2.31E-12	5800	3.19E-13
Styrene	Annual, 24-hr	5	7.510E-07	0.00010964	8.69204E-12	2.71E+01	2.36E-10	1.08E+02	9.43E-10			900	2.62E-13	21000	4.49E-14
Toluene	Annual, 24-hr	4.9	7.360E-07	0.00010745	8.5182E-12	2.71E+01	2.31E-10	1.08E+02	9.24E-10			300	7.70E-13	37000	2.50E-14
TCE	Annual	2.6	3.905E-07	5.7015E-05	4.51986E-12	2.71E+01	1.23E-10	1.08E+02	4.90E-10	7.00E-03	2.59E-10	600	2.04E-13		
Xylene	Annual, 24-hr	5.86	8.802E-07	0.0001285	1.01871E-11	2.71E+01	2.76E-10	1.08E+02	1.10E-09			700	3.95E-13	22000	5.02E-14
			5.605E-05	0.00818367							6.5894E-09		1.7817E-10		1.2E-10

Daily Emissions (lb/day) = peak daily influent flow (gal/day) x liquid conversion factor (3.785 L/gal) x toxic influent concentration (μg/L) x unit conversion factor (10-6 g/μg) x lb/453.6 g

Sources: Emission factors from SJVAPCD's Fugitive Air Emission Factors and and (ug/L) Concentration Values for Wastewater Treatment Plants (POTWS) November 1993.
OEHHA Revised Air Toxics Hot Spots Program Technical Support Document for Unit Risk and Cancer Potency Values Updated 2011. http://www.oehha.ca.gov/air/hot_spots/2009/AppendixA.pdf
OEHHA Acute and Chronic Reference Exposure Levels (RELs) as of August 2013. http://oehha.ca.gov/air/allrel/html

Notes: Emission factors from SJVAPCD's Fugitive Air Emission Factors and and (ug/L) Concentration Values for Wastewater Treatment Plants (POTWS) November 1993.
Assumed hydrogen sulfide would be controlled to 90% efficiency with scrubbers or biofilters that are part of the odor control system.
Cancer risk less than 10 in a million is considered less than significant.
Chronic and acute non-cancer risks less than 1 are considered less than significant.

Compounds	**Calculated dose (mg/kg-day)**
Ammonia	
Benzene	8.25498E-15
Chloroform	1.15285E-13
Ethyl Benzene	3.20236E-14
Hydrogen Sulfide	
1,1,1-TCA	
Methylene Chlorine	1.11015E-13
1,4-Dichlorobenzene	6.61822E-14
Phenol	
Styrene	
Toluene	
TCE	3.70051E-14
Xylene	

Values	**Variables**
365	Exposure Frequency (EF)
70	Exposure Duration (ED)
25550	Averaging Time (AT)
302	Daily Breathing Rate (DBR)
1	Inhalation Absorption Factor (A)
1.00E-03	Micrograms to milligrams conversion
1.00E-03	liters to cubic meters conversion
3.02E-04	Calculated exposure duration period
1.00E+06	risk per million people

02/03/15
16:44:26

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

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SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	12.8000
STK INSIDE DIAM (M)	=	0.9100
STK EXIT VELOCITY (M/S)	=	3.6600
STK GAS EXIT TEMP (K)	=	294.3000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	1.7000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.033 M**4/S**3; MOM. FLUX = 2.761 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
100.	232.6	1	1.0	1.0	320.0	22.62	27.00	14.23	NO
200.	266.2	3	1.0	1.0	320.0	22.55	23.78	14.30	NO
300.	240.7	3	1.0	1.0	320.0	22.55	34.40	20.52	NO
400.	236.6	4	1.0	1.0	320.0	22.43	29.58	15.52	NO
500.	219.8	4	1.0	1.0	320.0	22.43	36.25	18.50	NO
600.	206.7	5	1.0	1.1	10000.0	22.05	32.04	14.93	NO
700.	199.4	5	1.0	1.1	10000.0	22.05	36.87	16.72	NO
800.	207.1	6	1.0	1.1	10000.0	20.35	27.72	12.17	NO
900.	209.5	6	1.0	1.1	10000.0	20.35	30.85	13.16	NO
1000.	206.8	6	1.0	1.1	10000.0	20.35	33.95	14.12	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 100. M:

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
222.	271.1	3	1.0	1.0	320.0	22.55	26.26	15.75	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
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CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	271.1	222.	0.

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** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
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