ROTTEN ROBBIE SITE PLAN REVIEW AND MINOR USE PERMIT APPROVAL

AIR QUALITY ASSESSMENT

Manteca, California

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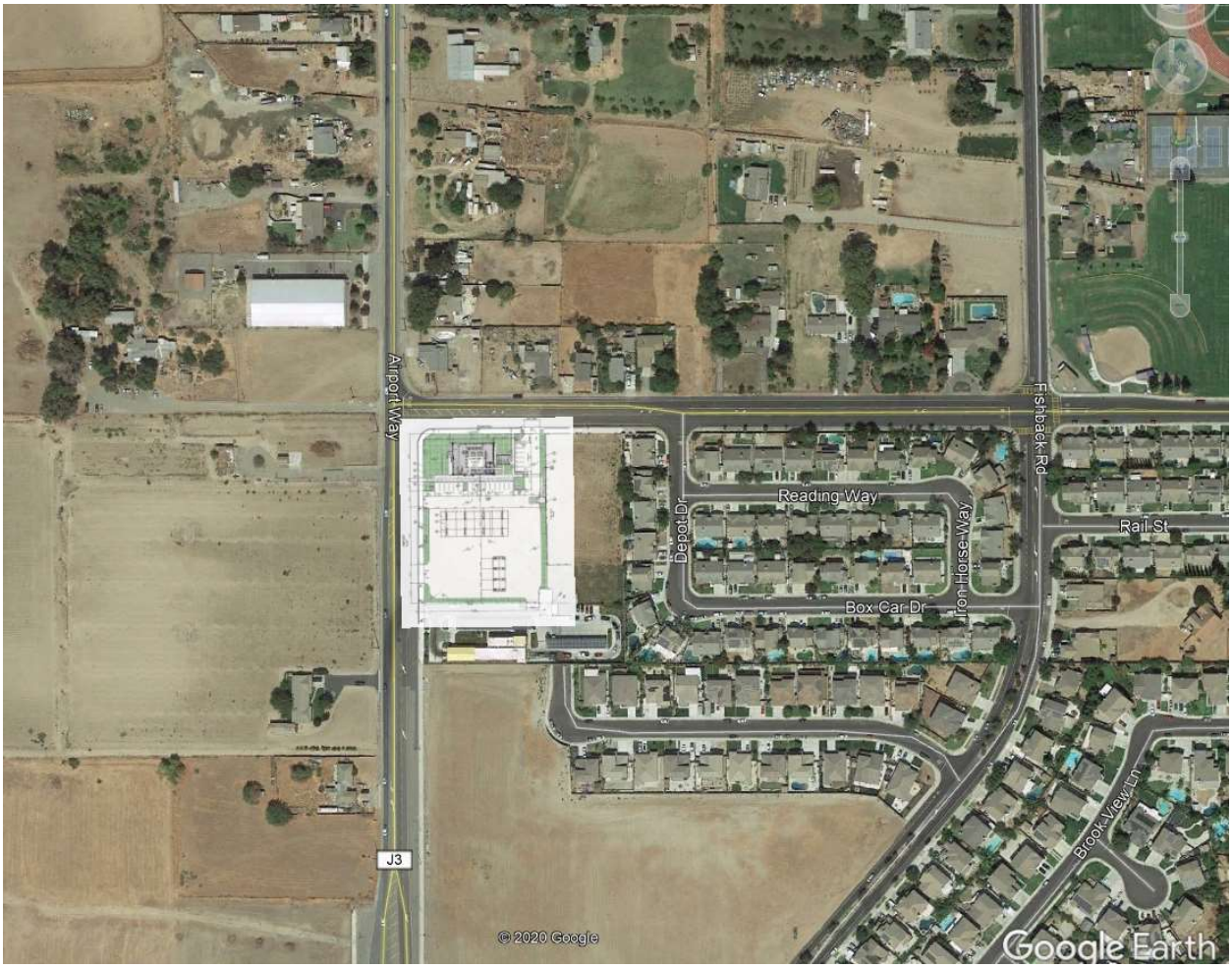
INTRODUCTION

This report assesses the air quality impacts associated with the Rotten Robbie fueling facility and convenience store proposed in Manteca, California. The Project will occupy a 2.02-acre site generally located at the southeast corner of S. Airport Way and Wawona Drive, as seen in Figure 1.

FIGURE 1. Rotten Robbie Project Location



The Proposed Project includes the construction of a 4,800-square foot (sf) convenience store and gasoline dispensing facility (gdf) with 21 parking spaces. There are eight 8 gas canopies associated with the convenience store. The gas canopies will provide unleaded gasoline and diesel fuel. The Proposed Project includes 16 standard fuel pumps and 4 diesel pumps. The fuel islands will each be covered by a fuel canopy. The standard fuel canopy will be 130-feet by 48-feet in size, and the diesel fuel canopy will be 22-feet by 65-feet in size.

The fuel will be stored in 4 underground storage tanks, located on the southerly portion of the project site. There will be a maximum of three employees on-site at all times during business

hours. Proposed hours of operation consist of 7 days per week, 24 hours per day for the fueling stations and convenience store. The Project Proponent estimates that approximately 13,000 gallons of fuel (including diesel) will be sold on a daily basis.

The project's potential impacts on air quality during construction and operation are assessed in this report. Development projects of this type in the San Joaquin Valley are most likely to cause air quality impacts from emissions generated during construction, evaporative on-site emissions from fueling operations and indirect emissions from vehicle traffic associated with operation of the project. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has published the Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) that was used to conduct this air quality analysis.[1] This report describes existing air quality conditions, construction period air quality impacts, operational air quality impacts (at both a local and regional scale), and identifies any necessary mitigation measures to reduce or eliminate air quality impacts identified as significant.

SETTING

TOPOGRAPHIC CONSIDERATIONS

The project site is located in San Joaquin County in the northern portion of the San Joaquin Valley Air Basin. The California Air Resources Board (CARB) defines the boundaries of the basin by the San Joaquin Valley within the Sierra Nevada Mountains to the east, the Coast Ranges in the west, and the Tehachapi mountains in the south. The valley is basically flat with a slight downward gradient to the northwest. The valley opens to the ocean at the Carquinez Strait where the San Joaquin-Sacramento Delta empties into San Francisco Bay. The San Joaquin Valley, thus, could be considered a "bowl" with the primary opening to the north. The surrounding topographic features restrict air movement through and out of the basin and, as a result, impede the dispersion of air pollutants from the basin. Wind flow is usually down the valley from the north, but the Tehachapi Mountains block or restrict the southward progression of airflow. The Sierra Nevada is a substantial barrier from the usual winds that have a general westerly flow. The topographical features result in weak airflow. The flow is further restricted vertically by inversion layers that are common in the San Joaquin Valley air basin throughout the year. An inversion layer is created when a mass of warm dry air sits over cooler air near the ground, preventing vertical dispersion of pollutants from the air mass below. During the summer, the San Joaquin Valley experiences daytime temperature inversions at elevations from 1,500 to 3,000 feet above the valley floor. Airflow is considerably restricted since mountain ranges surrounding the valley are generally above the inversion. These inversions lead to a buildup of ozone and ozone precursor pollutants. During the fall and winter months, strong surface-based inversions occur from 500 to 1,000 feet above the valley floor (SJVAPCD 1998). Wintertime inversions trap very stable air near the surface and lead primarily to a buildup of particulate matter air pollutants. Very light winds are also characteristic with these wintertime surface-based inversions.

[1] SJVAPCD. 2015. Guide for Assessing and Mitigating Air Quality Impacts. March.

AIR BASIN CHARACTERISTICS

The climate of the project area is characterized by hot dry summers and cool, mild winters. Clear days are common from spring through fall. Daytime temperatures in the summer often approach or exceed 100 degrees, with lows in the 60s. In the winter, daytime temperatures are usually in the 50s, with lows around 35 degrees. Radiation fog is common in the winter and may persist for days. Partly to mostly cloudy days are common in winter, as most precipitation received in the Valley falls from November through April.

Winds are predominantly up-valley (flowing from the north) in all seasons, but more so in the summer and spring months (CARB 1984). In this flow, winds are usually from the north end of the Valley and flow in a south-southeasterly direction, through Tehachapi Pass, into the Southeast Desert Air Basin. Annually, up-valley wind flow (i.e., northwest flow with marine air) is most common, occurring about 40 percent of the time. This type of flow is usually trapped below marine and subsidence inversions, restricting outflow through the Sierra Nevada and Tehachapi Mountains. The occurrence of this wind flow is almost 70 percent of the time in summer, but less than 20 percent of the time in winter. Winter and fall are characterized by mostly light and variable wind flow. Pacific storm systems do bring southerly flows to the valley during late fall and winter. Light and variable winds, less than 10 miles per hour (mph), are common in the colder months.

Superimposed on this seasonal regime is the diurnal wind cycle. In the Valley, this cycle takes the form of a combination of a modified sea breeze-land breeze and mountain-valley regimes. The sea breeze-land breeze regime typically has a modified sea breeze flowing into the Valley from the north during the late day and evening and then a land breeze flowing out of the Valley late at night and early in the morning. The mountain-valley regime has an upslope (mountain) flow during the day and a down slope (valley) flow at night. These effects create a complexity of regional wind flow and pollutant transport within the Valley.

The pollution potential of the San Joaquin Valley is very high. The San Joaquin Valley has one of the most severe air pollution problems in the State and the Country. Surrounding elevated terrain in conjunction with temperature inversions frequently restrict lateral and vertical dilution of pollutants. Abundant sunshine and warm temperatures in late spring, summer, and early fall are ideal conditions for the formation of ozone, where the Valley frequently experiences unhealthy air pollution days. Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high respirable particulate matter (PM_{10}) concentrations and elevated carbon monoxide (CO) levels.

REGULATORY SETTING

The Federal and California Clean Air Acts have established ambient air quality standards for different pollutants. National ambient air quality standards (NAAQS) were established by the Federal Clean Air Act of 1970 (amended in 1977 and 1990) for six "criteria" pollutants. These criteria pollutants now include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), respirable particulate matter with a diameter less than 10 microns (PM_{10}), sulfur dioxide ($S0_2$), and lead (Pb). In 1997, The Environmental Protection Agency (EPA) added fine particulate matter ($PM_{2.5}$) as a criteria pollutant. The air pollutants for which standards have been established are

considered the most prevalent air pollutants that are known to be hazardous to human health. California ambient air quality standards (CAAQS) include the NAAQS pollutants and also hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles. These additional CAAQS pollutants tend to have unique sources and are not typically examined in environmental air quality assessments. In addition, lead concentrations have decreased dramatically since it was removed from motor vehicle fuels.

Federal Regulations

At the federal level, the United States Environmental Protection Agency (US EPA) administers and enforces air quality regulations. Federal air quality regulations were developed primarily from implementation of the Federal Clean Air Act. If an area does not meet NAAQS over a set period (three years), EPA designates it as a "nonattainment" area for that particular pollutant. EPA requires states that have areas that do not comply with the national standards to prepare and submit air quality plans showing how the standards would be met. If the states cannot show how the standards would be met, then they must show progress toward meeting the standards. These plans are referred to as the State Implementation Plan (SIP). Under severe cases, EPA may impose a federal plan to make progress in meeting the federal standards.

EPA also has programs for identifying and regulating hazardous air pollutants. The Clean Air Act requires EPA to set standards for these pollutants and sharply reduce emissions of controlled chemicals. Industries were classified as major sources if they emitted certain amounts of hazardous air pollutants. The US EPA also sets standards to control emissions of hazardous air pollutants through mobile source control programs. These include programs that reformulated gasoline, national low emissions vehicle standards, Tier 2 motor vehicle emission standards, gasoline sulfur control requirements, and heavy-duty engine standards.

The San Joaquin Valley Air Basin is subject to major air quality planning programs required by the federal Clean Air Act (CAA) (1977, last amended in 1990, 42 United States Code [USC] 7401 *et seq.*) to address ozone, particulate matter air pollution, and carbon monoxide. The CAA requires that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards within the deadlines specified in the Clean Air Act. These plans are submitted to the State, which after approval, submits them to US EPA as the SIP.

State Regulations

The California Clean Air Act of 1988, amended in 1992, outlines a program for areas in the State to attain the CAAQS by the earliest practical date. CARB is the state air pollution control agency and is a part of the California EPA. The California Clean Air Act sets more stringent air quality standards for all of the pollutants covered under national standards, and additionally regulates levels of vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates. If an area does not meet CAAQS, CARB designates the area as a nonattainment area. The San Joaquin Valley Air Basin does not meet the CAAQS for ozone, PM_{10}, and $PM_{2.5}$. CARB requires regions that do not meet CAAQS for ozone to submit clean air plans that describe plans to attain the standard or show progress toward attainment.

In addition to the US EPA, CARB further regulates the amount of air pollutants that can be emitted by new motor vehicles sold in California. Motor vehicle emissions standards have always been more stringent than federal standards since they were first imposed in 1961. CARB has also developed Inspection and Maintenance (I/M) and "Smog Check" programs with the California Bureau of Automotive Repair. Inspection programs for trucks and buses have also been implemented. CARB also sets standards for motor vehicle fuels sold in California.

San Joaquin Valley

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is made up of eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings Tulare and the San Joaquin Valley portion of Kern. The primary role of the SJVAPCD is to develop plans and implement control measures in the San Joaquin Valley to control air pollution. These controls primarily affect stationary sources such as industry and power plants. Rules and regulations have been developed by SJVAPCD to control air pollution from a wide range of air pollution sources. In March 2007, an Indirect Source Review (ISR) rule was adopted that controls air pollution from new land developments. SJVAPCD also conducts public education and outreach efforts such as the Spare the Air, Wood Burning, and Smoking Vehicle voluntary programs.

City of Manteca General Plan 2023

The Air Quality Element and Resources Conservation Element for Energy establishes goals, objectives, and policies to guide planning decisions and provides the platform for local action in addressing air quality, energy, and climate change issues.

Applicable goals, objectives, and policies presented in the General Plan are as follows:

10. Air Quality Element

GOAL AQ -1 Improve air quality by:

- Achieving and maintaining ambient air quality standards established by the U.S. Environmental Protection Agency, the California Air Resources Board, and the San Joaquin Air Pollution Control District;
- Minimizing public exposure to toxic or hazardous air pollutants; and
- Minimizing public exposure to pollutants that create a public nuisance, such as unpleasant odors.

GOAL AQ -2 Integrate air quality planning with land use and transportation planning processes in order to reduce vehicle miles traveled in the City and by commuters.

GOAL AQ -3 Increase opportunities for alternatives to internal combustion automobiles including, but not limited to, public transportation, bicycles, walking and alternative fuel vehicles including hybrid gas-electric, electric and compressed natural gas.

GOAL AQ -4 Reduce air emissions through energy conservation.

Policies: Air Quality- Regional Coordination

AQ-P-1: Cooperate with other agencies to develop a consistent and coordinated approach to reduction of air pollution and management of hazardous air pollutants

Implementation: Air Quality- Regional Coordination

AQ-I-1. Work with the San Joaquin Valley Air Pollution Control District (APCD) to implement the Air Quality Management Plan (AQMP).

- Cooperate with the APCD to develop consistent and accurate procedures for evaluating project-specific and cumulative air quality impacts.
- Cooperate with the APCD and the California Air Resources Board in their efforts to develop a local airshed model.
- Cooperate with the APCD in their efforts to develop a cost/benefit analysis of possible control strategies (mitigation measures to minimize short and long-term stationary and area source emissions as part of the development review process, and monitoring measures to ensure that mitigation measures are implemented.

AQ-I-2. In accordance with CEQA, submit development proposals to the APCD for review and comment prior to decision.

AQ-I-3. Cooperate with the San Joaquin County Environmental Health Department in identifying hazardous material users and in developing a hazardous materials management plan.

Policies: Air Quality- Land Use

AQ-P-2: Develop a land use plan that will help to reduce the need for trips and will facilitate the common use of public transportation, walking, bicycles, and alternative fuel vehicles.

AQ-P-3: Segregate and provide buffers between land uses that typically generate hazardous or obnoxious fumes and residential or other sensitive land uses.

Implementation: Air Quality- Land Use

AQ-I-4. Encourage mixed-use development that is conveniently accessible by pedestrians and public transit.

AQ-I-5. Locate employment, school, and daily shopping destinations near residential areas.

AQ-I-6. Locate higher intensity development such as multi-family housing, institutional uses, services, employment centers and retail along existing and proposed transit corridors.

AQ-I-7. Locate public facilities in areas easily served by current and planned public transportation.

AQ-I-8. Prior to entitlement of a project that may be an air pollution point source, such as a manufacturing and extracting facility, the developer shall provide documentation that the use is located and appropriately separated from residential areas and sensitive receptors (e.g., homes, schools, and hospitals).

Policies: Air Quality- Transportation

AQ-P-4: Develop and maintain street systems that provide for efficient traffic flow and thereby minimize air pollution from automobile emissions.

AQ-P-5: Develop and maintain circulation systems that provide alternatives to the automobile for transportation, including bicycles routes, pedestrian paths, bus transit, and carpooling.

AQ-P-6: Coordinate public transportation networks, including trains, local bus service, regional bus service and rideshare facilities to provide efficient public transit service.

Implementation: Air Quality- Transportation

AQ-I-9. Maintain acceptable traffic levels of service (LOS) as specified in the Circulation Element.

AQ-I-10. In new subdivisions, require the internal street system to include the installation of dedicated pedestrian/bicycle pathways connecting to adjacent residential and commercial areas as well as schools, parks and recreational areas.

AQ-I-11. Provide adequate pedestrian and bikeway facilities for present and future transportation needs throughout the City.

Policies: Air Quality- Dust and Other Airborne Particulate Materials

AQ-P-7: New construction will be managed to minimize fugitive dust and construction vehicle emissions.

AQ-P-8: Woodburning devices shall meet current standards for controlling particulate air pollution.

AQ-P-9: Burning of any combustible material within the City will be controlled to minimize particulate air pollution.

Implementation: Air Quality- Dust and Other Airborne Particulate Materials

AQ-I-12. Construction activity plans shall include and/or provide for a dust management plan to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard. ! Project development applicants

shall be responsible for ensuring that all adequate dust control measures are implemented in a timely manner during all phases of project development and construction.

AQ-I-13. All residences built in a new subdivision or housing development shall be equipped with conventional heating devices with sufficient capacity to heat all areas of the building without reliance on woodburning heating devices.

AQ-I-14. All woodburning-heating devices installed shall meet EPA standards applicable at the time of project approval.

Policies: Air Quality- Reduce Emissions From Energy Generating Facilities

AQ-P-10: Encourage energy efficient building designs.

Implementation: Air Quality- Reduce Emissions From Energy Generating Facilities

AQ-I-15. Design review criteria shall include the following considerations, at a minimum:

- The developer of a sensitive air pollution receptor shall submit documentation that the project design includes appropriate buffering (e.g., setbacks, landscaping) to separate the use from highways, arterial streets, hazardous material locations and other sources of air pollution or odor.
- Promote the use of new and replacement fuel storage tanks at refueling stations that are clean fuel compatible, if technically and economically feasible.
- The use of energy efficient lighting (including controls) and process systems beyond Title 24 requirements shall be encouraged where practicable (e.g., water heating, furnaces, boiler units, etc.)
- The use of energy efficient automated controls for air conditioning beyond Title 24 requirements shall be encouraged where practicable.
- Promote solar access through building siting to maximize natural heating and cooling, and landscaping to aid passive cooling and to protect from winds.

10. Resources Conservation Element, Section 8.4 Energy Conservation

Goal RC-3. The City shall ensure that land use and circulation improvements are coordinated to reduce the number and length of vehicle trips and thereby help conserve scarce or nonrenewable energy resources.

Goal RC-4. Encourage private development to explore and apply non-traditional energy sources such as co-generation, wind, and solar to reduce dependence on traditional energy sources.

Goal RC-5. Promote energy efficiency in new development and in building design.

8.4.1 Policies: Energy Conservation

RC-P-6. Comply with construction and design standards that promote energy conservation.

RC-P-7. Conserve public utilities.

RC-P-8. Conserve petroleum products.

RC-P-9. The City shall support use of alternative energy sources in new commercial, industrial and residential development.

8.4.2 Implementation: Energy Conservation

RC-I-6. The City shall implement development standards that promote energy conservation and the use of solar energy techniques for heating and cooling, including building orientation, street and lot layout, landscape placement, and protection of solar access.

RC-I-7. Implement construction standards which promote energy conservation including window placement, building eaves, and roof overhangs.

RC-I-8. The City shall enforce Title 24 energy requirements (Building Code, California Code of Regulations (CCR)) which define construction standards that promote energy conservation.

RC-I-9. Develop a public education program to increase public participation in energy conservation.

RC-I-10. Encourage large energy users to use an energy conservation plan as part of the project review and approval process, and develop a program to monitor compliance with and effectiveness of that plan.

RC-I-11. Cooperate with other agencies and jurisdictions to expand energy conservation programs.

RC-I-12. Investigate alternative energy sources including co-generation, active solar energy, and wind generation.

RC-I-13. Implement Transportation System Management (TSM) measures, as outlined in the Circulation Element, which reduce the need for automobile use and petroleum products through an efficient roadway and intersection system. The circulation pattern is designed to minimize trips required for shopping and daily errands.

RC-I-14. Develop alternative transportation systems, such as public transportation and bikeways, which reduce the need for automobile use and petroleum products.

RC-I-15. Comply with state requirements for regulation of new fireplaces and wood stoves.

NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS

The CAA and CCAA promulgate, respectively, national and State ambient air quality standards. Air quality standards have been established by US EPA (i.e., NAAQS) and California (i.e., CAAQS) for specific air pollutants most pervasive in urban environments. The NAAQS and CAAQS are shown in Table 1. Ambient standards specify the concentration of pollutants to which the public may be exposed without adverse health effects. Individuals vary in their sensitivity to air pollutants, and standards are set to protect more pollution-sensitive populations (e.g., children and the elderly). National and State standards are reviewed and updated periodically based on new health studies. California ambient standards tend to be at least as protective as national ambient standards and are often more stringent. For planning purposes, regions like the San Joaquin Valley Air Basin are given an air quality status designation by the federal and State regulatory agencies. Areas with monitored pollutant concentrations that are lower than ambient air quality standards are designated "attainment" on a pollutant-by-pollutant basis. When monitored concentrations exceed ambient standards within an air basin, it is designated "nonattainment" for that pollutant. US EPA designates areas as "unclassified" when insufficient data are available to determine the attainment status. These areas are typically considered to be in attainment of the standard.

CRITERIA AIR POLLUTANTS AND THEIR HEALTH EFFECTS

The primary criteria air pollutants that would be emitted by the project include ozone (O_3) precursors (NO_x and ROG), carbon monoxide (CO), and suspended particulate matter (PM_{10} and $PM_{2.5}$). Other criteria pollutants, such as lead (Pb) and sulfur dioxide (SO_2), would not be substantially emitted by the Grape Solar project or traffic, and air quality standards for them are being met throughout the San Joaquin Valley Air Basin. A description of each pollutant is provided below, as described by SJVAPCD (2015) and the Bay Area Air Quality Management District.[2]

Ozone (O_3)

CARB describes the ozone and health impacts (CARB 2016a). While O_3 serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation potentially harmful to humans, when it reaches elevated concentrations in the lower atmosphere (troposphere) it can be harmful to the human respiratory system and to sensitive species of plants. Ozone concentrations build to peak levels during periods of light winds, bright sunshine, and high temperatures. Short-term O_3 exposure can reduce lung function in children, make persons susceptible to respiratory infection, and produce symptoms that cause people to seek medical treatment for respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. A healthy person exposed to high concentrations may become nauseated or dizzy, may develop headache or cough, or may experience a burning sensation in the chest.

Ozone is formed in the atmosphere by a complex series of photochemical reactions that involve "ozone precursors" that consist of two families of pollutants: oxides of nitrogen (NO_x) and reactive

[2] Bay Area Air Quality Management District (BAAQMD). 2011. *BAAQMD CEQA Air Quality Guidelines*. May (updated May 2017). http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

organic gases (ROG). NO_x and ROG are emitted from a variety of stationary and mobile sources. While NO_2, an oxide of nitrogen, is another criteria pollutant itself, ROGs are not in that category, but are included in this discussion as O_3 precursors. In 2007, CARB adopted an 8-hour health-based standard for O_3 of 0.070 parts per million (ppm). The U.S. EPA revised the 8-hour NAAQS for O_3 from 0.080 ppm in 2008 and reduced it again in 2015 to 0.070 ppm[3] (CARB 2005, 2012, US EPA 2018).

TABLE 1 Ambient Air Quality Standards[4]

Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
Ozone	1-hour	0.09 ppm (180 µg/m^3)	—
	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3) (3-year average of annual 4th highest daily maxima)
Carbon Monoxide	8-hour	9.0 ppm (10,000 µg/m^3)	9 ppm (10,000 µg/m^3)
	1-hour	20 ppm (23,000 µg/m^3)	35 ppm (40,000 µg/m^3)
Nitrogen dioxide	Annual Average	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
	1-hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3) (3-year average of annual 98th percentile daily maxima)
Sulfur dioxide			
	24-hour	0.04 ppm (105 µg/m^3)	—
	3-hour	—	0.5 ppm (1,300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3) (3-year average of annual 99th percentile daily maxima)
Respirable particulate matter (10 micron)	24-hour	50 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	—
Fine particulate matter (2.5 micron)	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3 (3-year average)
	24-hour	—	35 µg/m^3 (3-year average of annual 98th percentile daily concentrations)
Sulfates	24-hour	25 µg/m^3	—
Lead	30-day	1.5 µg/m^3	—
	3 Month Rolling Average	—	0.15 µg/m^3

Source: CARB website, 12/1/16.
SO_2 Federal 24 hour and annual standards are not applicable in the SJVAPCD.
µg/m^3 = micrograms per cubic meter
ppm = parts per million

[3] U.S. EPA. 2017. *2008 National Ambient Air Quality Standards (NAAQS) for Ozone*. See https://www.epa.gov/ozone-pollution/2008-national-ambient-air-quality-standards-naaqs-ozone. Accessed 06/19/18.

[4] Source: California Air Resources Board (http://www.arb.ca.gov)

Carbon Monoxide (CO)

CARB describes carbon monoxide and the health effects (CARB 2016b). Carbon monoxide or CO is a colorless, odorless, poisonous gas. Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause dizziness and fatigue, and causes reduced lung capacity, impaired mental abilities and central nervous system function, and induces angina in persons with serious heart disease. Primary sources of CO in ambient air are exhaust emissions from on-road vehicles, such as passenger cars and light-duty trucks, and residential wood burning. The monitored CO levels in the Valley during the last 10 years have been well below ambient air quality standards.

Nitrogen Dioxide (NO_2)

As described by CARB (2016c), the major health effect from exposure to high levels of NO_2 is the risk of acute and chronic respiratory disease. Nitrogen dioxide is a combustion by-product, but it can also form in the atmosphere by chemical reaction. Nitrogen dioxide is a reddish-brown colored gas often observed during the same conditions that produce high levels of O_3 and can affect regional visibility. Nitrogen dioxide is one compound in a group of compounds consisting of oxides of nitrogen (NO_x). As described above, NO_x is an O_3 precursor compound. Monitored levels of NO_2 in the Valley are below ambient air quality standards.

Particulate Matter (PM)

CARB describes unhealthy particulate matter and the health effects (CARB 2016d). Respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled and cause adverse health effects. PM_{10} and $PM_{2.5}$ are a health concern, particularly at levels above the Federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health because minute particles are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of $PM_{2.5}$ because their immune and respiratory systems are still developing. These fine particulates have been demonstrated to decrease lung function in children. Certain components of PM are linked to higher rates of lung cancer. Very small particles of certain substances (e.g., sulfates and nitrates) can also directly cause lung damage or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health.

Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as mining and demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. In addition to health effects, particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is more easily filtered by human breathing passages. This type of dust is considered more of a soiling nuisance rather than

a health hazard.

The current State PM_{10} standard, approved in 2002, is 20 micrograms per cubic meter ($\mu g/m^3$) for an annual average. The 24-hour average standard is 50 $\mu g/m^3$. $PM_{2.5}$ standards were first promulgated by the U.S. EPA in 1997 and were revised in 2006 to lower the 24-hour $PM_{2.5}$ standard to 35 $\mu g/m^3$ for 24-hour exposures (Federal Register, Vol. 71, No. 10, January 17, 2006). That same action by U.S. EPA also revoked the annual PM_{10} standard due to lack of scientific evidence correlating long-term exposures of ambient PM_{10} with health effects. CARB has only adopted an annual average $PM_{2.5}$ standard, which is set at 12 $\mu g/m^3$. This is equal to the NAAQS of 12 $\mu g/m^3$ (CARB 2016f).

TOXIC AIR CONTAMINANTS

Besides the "criteria" air pollutants, there is another group of substances found in ambient air referred to as Hazardous Air Pollutants (HAPs) under the CAA and Toxic Air Contaminants (TACs) under the CCAA. These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs for long periods. They are regulated at the local, state, and federal level.

HAPs are the air contaminants identified by U.S. EPA as known or suspected to cause cancer, serious illness, birth defects, or death. Many of these contaminants originate from human activities, such as fuel combustion and solvent use. Mobile source air toxics (MSATs) are a subset of the 188 HAPS. Of the 21 HAPs identified by U.S. EPA as MSATs, a priority list of six priority HAPs were identified that include: diesel exhaust, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. The Federal Highway Administration (FHWA 2012) reports that while vehicle miles traveled (VMT) in the United States is expected to increase by 64 percent over the period 2000 to 2020, emissions of MSATs are anticipated to decrease substantially as a result of efforts to control mobile source emissions (by 57 percent to 67 percent depending on the contaminant).

California developed a program under the Toxic Air Contaminant Identification and Control Act (Assembly Bill [AB] 1807, Tanner 1983), also known as the Tanner Toxics Act, to identify, characterize and control TACs. Subsequently, AB 2728 (Tanner, 1992) incorporated all 188 HAPs into the AB 1807 process. TACs include all HAPs plus other containments identified by CARB. These are a broad class of compounds known to cause morbidity or mortality (cancer risk). TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter (DPM) near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level.

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly), described by CARB (2016e), was enacted in 1987, and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels.

Particulate matter from diesel exhaust is the predominant TAC in urban air and is estimated to represent about 70 percent of the cancer risk from TACs, based on the statewide average reported by CARB (2012). According to CARB, diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by CARB, and are listed as carcinogens either under State Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB (2012) reports that recent air pollution studies have shown an association that diesel exhaust and other cancer-causing TACs emitted from vehicles are responsible for much of the overall cancer risk from TACs in California. Particulate matter emitted from diesel-fueled engines (DPM) was found to comprise much of that risk. In 1998, CARB formally identified DPM as a TAC (CARB 2012). DPM is of particular concern since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by U.S. EPA as HAPs, and by CARB as TACs. The vast majority of diesel exhaust particles (over 90 percent) consist of $PM_{2.5}$, which are the particles that can be inhaled deep into the lung (CARB 2012). Like other particles of this size, a portion will eventually become trapped within the lung possibly leading to adverse health effects. While the gaseous portion of diesel exhaust also contains TACs, CARB's 1998 action was specific to DPM, which accounts for much of the cancer-causing potential from diesel exhaust. California has adopted a comprehensive diesel risk reduction program to reduce DPM emissions 85 percent by 2020 (CARB 2000). The EPA and CARB adopted low sulfur diesel fuel standards in 2006 that reduce DPM substantially.

Smoke from residential wood combustion can be a source of TACs. Wood smoke is typically emitted during winter when dispersion conditions are poor. Localized high TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind the pollution can persist for many hours, especially in sheltered valleys during winter. Wood smoke also contains a significant amount of PM_{10} and $PM_{2.5}$. Wood smoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

EXISTING AIR QUALITY

As previously discussed, the San Joaquin Valley experiences poor air quality conditions, due primarily to elevated levels of ozone and particulate matter (SJVAPCD 2015a). CARB, in cooperation with SJVAPCD, monitors air quality throughout the San Joaquin Valley Air Basin. Monitoring data presented in Table 2 was derived for each pollutant based upon the closest monitoring station to the project site.

Ozone

In California, ozone concentrations are generally lower near the coast regions than inland regions. The inland regions, such as the San Joaquin Valley, typically experience some of the higher ozone concentrations. This is because of the greater frequency of hot days (that is, higher temperatures) and stagnant air conditions (that is, very calm atmospheric conditions with very gentle winds) that are conducive to ozone formation. Many areas of the Valley lie downwind of urban areas that are

sources of ozone precursor pollutants. While Kings County is fairly rural, exceedances of the ozone standard occurred on 29 to 49 days per year, based on the last 3 years of available monitoring data.

Carbon Monoxide

State and federal standards for carbon monoxide are met throughout California as a result of cleaner vehicles and fuels that were reformulated in the 1990s. For CO, the 2012 monitored value of 2.2 ppm for an 8-hour average was used as the air basin maximum level (CARB 2016f). Because CO levels are so low in the air basin, monitoring was discontinued after 2012.

TABLE 2 Summary of Criteria Air Pollution Monitoring Data for San Joaquin County

Pollutant	Standard	Monitored Values[1] and Exceedance Days		
		2016	2017	2018
Ozone (ppm) measured in Stockton	State 1-Hour	**0.102 / 2**	0.085 / 0	0.088 / 0
Ozone (ppm) measured in Stockton	State 8-Hour	**0.079 / 2**	**0.080 / 2**	**0.078 / 2**
Ozone (ppm) measured in Stockton	Federal 8-Hour	**0.078 / 2**	**0.079 / 2**	**0.077 /1**
PM_{10} (ug/m^3) measured in Stockton	State 24-Hour	**66.5/ 31**	**92.6/ 43**	**198.6/ 32**
PM_{10} (ug/m^3) measured in Stockton	Federal 24-Hour	65.9/ 0	89.9/ 0[2]	**187.0/ 13[2]**
PM_{10} (ug/m^3) measured in Stockton	State Annual	**26.5**	**28.8**	**29.5**
$PM_{2.5}$ (ug/m^3) measured in Manteca	Federal 24-Hour	**50.8/ 5**	**50.0 / 9[2]**	**180.0 / 16[2]**
$PM_{2.5}$ (ug/m^3) measured in Manteca	State Annual	9.8	11.0	--
$PM_{2.5}$ (ug/m^3) measured in Manteca	Federal Annual	9.8	11.1	**13.4**
Carbon Monoxide (ppm)	State/Fed.8-Hour	NA / --[3]	NA / --[3]	NA / --[3]
Nitrogen Dioxide (ppm) measured in Stockton	State 1-Hour	0.06 / 0	0.06 / 0	0.07 / 0
Nitrogen Dioxide (ppm) measured in Stockton	Federal 1-Hour	0.049 / 0	0.048 / 0	0.052 / 0
Nitrogen Dioxide (ppm) measured in Stockton	State Annual	0.012	0.011	0.012

Note: (1) Monitored values are the high values considering the form of the applicable standard,
(2) affected by October 2017 and 2018 firestorms, and
(3) NA = not available in summaries, but last measured levels in 2012 were 2 ppm.
Source: CARB ADAM Data at http://www.arb.ca.gov/adam/index.html, Accessed 01/22/2020

Particulate Matter ($PM_{2.5}$ and PM_{10})

Most areas of California have either 24-hour or annual PM_{10} concentrations that exceed the State standards. Most urban areas exceed the State annual standard and the 2006 24-hour federal standard. In the San Joaquin Valley (S.J. Valley or Valley), there is a strong seasonal variation in PM, with higher PM_{10} and $PM_{2.5}$ concentrations occurring in the fall and winter months. These

higher concentrations are caused by increased activity for some emission sources and meteorological conditions that are conducive to the build-up of particulate matter. Industry and motor vehicles consistently emit particulate matter. Seasonal sources of particulate matter in San Joaquin Valley include wildfires, agricultural activities, windblown dust, and residential wood burning. In California, area sources, which primarily consist of fugitive dust, account for the majority of directly emitted particulate matter. This includes dust from paved and unpaved roads. The ARB estimates that 85 percent of directly emitted PM_{10} (and 66 percent of directly emitted $PM_{2.5}$) is from area sources (SJVAPCD 2016). During the winter, the $PM_{2.5}$ size fraction makes up much of the total particulate matter concentrations. The major contributor to high levels of ambient $PM_{2.5}$ is the secondary formation of particulate matter caused by the reaction of NO_x and ammonium to form ammonium nitrate. ARB estimates that the secondary portion of $PM_{2.5}$ makes up about 50 percent of the annual concentrations in the Valley (SJVAPCD 2016). The S.J. Valley also records high PM_{10} and $PM_{2.5}$ levels during the fall. During this season, both the coarse fraction (from dust) and the $PM_{2.5}$ fraction result in elevated $PM_{2.5}$ and PM_{10} concentrations. Measured $PM_{2.5}$ levels exceeded federal standards on 5 to 15 days per year. Measured PM_{10} levels exceeded State standards on an estimated 30 to 43 days.

Other Pollutants

Current and past air monitoring data indicate that the San Joaquin Valley meets ambient air quality standards for NO_2, SO_2, and lead. Monitoring of lead, sulphates, hydrogen sulfide and vinyl chloride is not routinely conducted by CARB in the air basin (CARB 2018).

Air Quality Trends

Air quality in the Valley has improved significantly despite a natural low capacity for pollution, created by unique geography, topography, and meteorology. Emissions have been reduced at a rate similar or better than other areas in California. Since 1990, emissions of ozone precursors (i.e., NO_x and ROG) reduced by 80 percent (CARB 2016g), resulting in much fewer days where ozone standards have been exceeded. Direct emissions of PM_{10} and $PM_{2.5}$ have been reduced by 10 to 13 percent (CARB 2013). As a result, the San Joaquin Valley is the first air basin that was previously classified as "serious nonattainment" under the NAAQS to come into attainment of the PM_{10} standards.

ATTAINMENT STATUS

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The San Joaquin Valley as a whole does not meet State or federal ambient air quality standards for ground level O_3 and State standards for PM_{10} and $PM_{2.5}$. The attainment status for the Valley with respect to various pollutants of concern is described in Table 3.

Under the CAA, the U.S. EPA has classified the Air Basin as *extreme nonattainment* for the 8-hour O_3 standard. As mentioned earlier, the Air Basin has attained the NAAQS for PM_{10}. The Air Basin is designated *nonattainment* for the older 1997 $PM_{2.5}$ NAAQS. U.S. EPA recently

designated the Air Basin as nonattainment for the newer 2006 24-hour $PM_{2.5}$ standard. The U.S. EPA classifies the Air Basin as *attainment* or *unclassified* for all other air pollutants, which include CO and NO_2.

At the state level, the Air Basin is considered *severe nonattainment* for ground level O_3 and *nonattainment* for PM_{10} and $PM_{2.5}$. In general, California ambient air quality standards are more stringent than the national ambient air quality standards. The Air Basin is required to adopt plans on a triennial basis that show progress towards meeting the State O_3 standard. The Air Basin is considered *attainment* or *unclassified* for all other pollutants.

TABLE 3 Project Area Attainment Status

Pollutant	Federal Status	State Status
Ozone (O_3) – 1-Hour Standard	No Designation	Severe Nonattainment
Ozone (O_3) – 8-Hour Standard	Extreme Nonattainment	Nonattainment
Respirable Particulate Matter (PM_{10})	Attainment-Maintenance	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Sulfates and Lead	No Designation	Attainment
Hydrogen Sulfide	No Designation	Unclassified
Visibility Reducing Particles	No Designation	Unclassified
Vinyl Chloride	No Designation	Attainment

REGIONAL AIR QUALITY PLANS

In response to not meeting the NAAQS, the region is required to submit attainment plans to US EPA through the State, which are referred to as the SIP. These plans are provided on SJVAPCD's website at

CARB submitted the 2004 Extreme Ozone Attainment Demonstration Plan to EPA in 2004, which addressed the old 1-hour NAAQS. The region's 2007 Ozone Plan, addressing the 8-hour ozone NAAQS, was submitted to US EPA and approved in March 2012. That plan predicts attainment of the standard throughout 90 percent of the district by 2020 and the entire district by 2024. To accomplish these goals, that plan would reduce NO_x emissions further by 75 percent and ROG emissions by 25 percent. A wide variety of control measures are included in these plans, such as reducing or offsetting emissions from construction and traffic associated with land use developments. The air basin was since designated as an extreme ozone nonattainment area for the more stringent 2008 8-hour ozone NAAQS. The 2016 Plan for the 2008 8-Hour Ozone Standard

was adopted by SJVAPCD on June 16, 2016. Addressing the 2008 8-hour ozone standard will pose a tremendous challenge for the Valley, as NOx emissions will be reduced by 60 percent. will bring the San Joaquin Valley into attainment of EPA's 2008 8-hour ozone standard as expeditiously as practicable, no later than December 31, 2031. SJVAPCD's 2016 Ozone Plan received EPA's final approval or conditional approval of all portions of the plan in 2019. EPA found that sufficient quantified emissions reductions are identified in the plan without including unquantified emissions reductions such as those related to the "further study" of Rule 4694 that controls emissions from winery activities (fermentation and storage of wines).

On April 25, 2008, US EPA proposed to approve the 2007 PM_{10} Maintenance Plan and Request for Re-designation. The region now meets the NAAQS for PM_{10}. The SJVAPCD adopted the 2008 $PM_{2.5}$ Plan on April 30, 2008. US EPA has designated the basin as Attainment.

The SJVAPCD adopted the 2018 Plan for the 1997, 2006 and 2012 $PM_{2.5}$ Plan Standards on November 15, 2018. This plan was approved by CARB on January 24, 2019. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable. The plan uses control measures to reduce NO_x, which also leads to fine particulate formation in the atmosphere. The plan incorporates measures to reduce direct emissions of $PM_{2.5}$, including a strengthening of regulations for various SJVAB industries and the general public through new rules and amendments. The plan increases controls on residential wood-burning activities.

Both the ozone and $PM_{2.5}$ plans include all measures (i.e., federal, state and local) that would be implemented through rule making or program funding to reduce air pollutant emissions. Transportation Control Measures (TCMs) are part of these plans. The plans described above addressing ozone also meet the state planning requirements.

SJVAPCD RULES AND REGULATIONS

The SJVAPCD has adopted rules and regulations that apply to land use projects, such as the proposed project. These are described below.

SJVAPCD Indirect Source Review Rule

In 2005, the SJVAPCD adopted Rule 9510 Indirect Source Review (ISR or Rule 9510) to reduce NO_x and PM_{10} emissions from new land use development projects. The rule, which became effective March 1, 2006, is the result of state requirements outlined in the region's portion of the State Implementation Plan (SIP). Rule 9510 was amended in December 2017 (and became effective March 21, 2018) to ensure that all large development projects are subject to the rule (SJVAPCD 2017). The SJVAPCD's SIP commitments are contained in the 2004 Extreme Ozone Attainment Demonstration Plan and the 2003 PM_{10} Plan. These plans identified the need to reduce PM_{10} and NO_x substantially in order to attain and maintain the ambient air-pollution standards on schedule.

New projects that would generate substantial air pollutant emissions are subject to this rule. The rule requires projects to mitigate both construction and operational period emissions by applying the SJVAPCD-approved mitigation measures and paying fees to support programs that reduce

emissions. The rule requires mitigated exhaust emissions during construction based on the following levels:

- 20 percent reduction from unmitigated baseline in total NO_x exhaust emissions
- 45 percent reduction from unmitigated baseline in total PM_{10} exhaust emissions

For operational emissions, Rule 9510 requires the following reductions:

- 33.3 percent of the total operational NO_x emissions from unmitigated baseline
- 50 percent of the total operational PM_{10} exhaust emissions from unmitigated baseline

Fees apply to the unmitigated portion of the emissions and are based on estimated costs to reduce the emissions from other sources plus estimated costs to cover administration of the program. In accordance with ISR, the project applicant will submit an application for approval of an Air Impact Assessment (AIA) to the SJVAPCD.

Regulation VIII – Fugitive PM_{10}

SJVAPCD controls fugitive PM_{10} through Regulation VIII (Fugitive PM_{10} Prohibitions). The purpose of this regulation is to reduce ambient concentrations of PM_{10} by requiring actions to prevent, reduce or mitigate anthropogenic (human caused) fugitive dust emissions. This applies to activities such as construction, bulk materials, open areas, paved and unpaved roads, material transport, and agricultural areas. Sources regulated are required to provide dust control plans that meet the regulation requirements. Fees are collected by SJVAPCD to cover costs for reviewing plans and conducting field inspections.

SJVAPCD regulates the emissions of organic compounds (i.e., ROG) from gasoline dispensing stations through Regulation IV, Rule 4622. This rule requires the facility to install enhanced vapor recovery (EVR systems). This type of Gasoline Dispensing Facilities would be required to install CARB-certified Phase-I and Phase-II vapor recovery equipment. A Health Risk Assessment (HRA) would be required by SJVAPCD since the annual benzene emissions, a TAC, would exceed the District toxic air contaminant risk triggering levels.

Other SJVAPCD Rules

Other SJVAPCD Rules and Regulations that may be applicable to the project include, but are not limited to:

- Rule 4101 (Visible Emissions): The purpose of this rule is to prohibit the emissions of visible air contaminants to the atmosphere. The provisions of this rule apply to any source operation which emits or may emit air contaminants.
- Rule 4102 (Nuisance): The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials.
- Rule 4601 (Architectural Coatings): The purpose of this rule is to limit Volatile Organic Compounds (VOC) emissions from architectural coatings. Emissions are reduced by limits on VOC content and providing requirements on coatings storage, cleanup, and labeling.

- Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations): The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. Paving operations will be subject to Rule 4641.

The Air District is anticipated to provide a determination of applicable rules/regulations to the project when specific building, grading, etc. plans are provided to the Air District prior to initiation of construction- and operation-related activities that fall within the purview of the Air District's regulatory authority.

SENSITIVE RECEPTORS

"Sensitive receptors" are defined as facilities where sensitive population groups, such as children, the elderly, the acutely ill, and the chronically ill, are likely to be located. Land uses that include sensitive receptors are residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics. The nearest residences consist of residences located to the north, east and southwest of the project site. The closes sensitive receptors are located east of the site.

GREENHOUSE GASES (GHGS)

Gases that trap heat in the atmosphere, Greenhouse gases (GHGs), regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO_2) and water vapor but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO_2 and N_2O are byproducts of fossil fuel combustion.
- N_2O is associated with agricultural operations such as fertilization of crops.
- CH_4 is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO_2 equivalents (CO_2e).

An expanding body of scientific research supports the theory that global climate change is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate

and several naturally occurring resources within California are adversely affected by the global warming trend. Increased precipitation and sea level rise will increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes and drought; wildfires and increased levels of air pollution.

Recent Regulatory Actions

Assembly Bill 32 (AB 32), California Global Warming Solutions Act (2006)

AB 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, California Energy Commission (CEC), California Public Utilities Commission (CPUC), and Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 million metric tons (MMT) of CO_2e as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit is a cumulative statewide limit, not a sector- or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast, in light of the economic downturn, to 545 MMT of CO_2e. Two GHG emissions reduction measures currently enacted that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMT of CO_2e. Thus, an estimated reduction of 80 MMT of CO_2e is necessary to reduce statewide emissions to meet the AB 32 target by 2020.

Senate Bill 375, California's Regional Transportation and Land Use Planning Efforts (2008)

California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 provides incentives for local governments and applicants to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allows applicants to bypass certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with

traffic congestion, would be encouraged. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB works with the metropolitan planning organizations (e.g. Association of Bay Area Governments [ABAG] and Metropolitan Transportation Commission [MTC]) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

SB 350 Renewable Portfolio Standards

In September 2015, the California Legislature passed SB 350, which increases the states Renewables Portfolio Standard (RPS) for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

Executive Order EO-B-30-15 (2015) and SB 32 GHG Reduction Targets

In April 2015, Governor Brown signed Executive Order which extended the goals of AB 32, setting a greenhouse gas emissions target at 40 percent of 1990 levels by 2030. On September 8, 2016, Governor Brown signed SB 32, which legislatively established the GHG reduction target of 40 percent of 1990 levels by 2030. In November 2017, CARB issued *California's 2017 Climate Change Scoping Plan*. While the State is on track to exceed the AB 32 scoping plan 2020 targets, this plan is an update to reflect the enacted SB 32 reduction target.

SB 32 was passed in 2016, which codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. CARB is currently working on a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The proposed Scoping Plan Update was published on January 20, 2017 as directed by SB 32 companion legislation AB 197. The mid-term 2030 target is considered critical by CARB on the path to obtaining an even deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The Scoping Plan outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue driving down GHG emissions and obtain the statewide goals.

The new Scoping Plan establishes a strategy that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-term goal). Key features of this plan are:

- Cap and Trade program places a firm limit on 80 percent of the State's emissions;
- Achieving a 50-percent Renewable Portfolio Standard by 2030 (currently at about 29 percent statewide);
- Increase energy efficiency in existing buildings;
- Develop fuels with an 18-percent reduction in carbon intensity;
- Develop more high-density, transit-oriented housing;
- Develop walkable and bikeable communities;
- Greatly increase the number of electric vehicles on the road and reduce oil demand in

half;

- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;
- Reduce freight-related emissions by transitioning to zero emissions where feasible and near-zero emissions with renewable fuels everywhere else; and
- Reduce "super pollutants" by reducing methane and hydrofluorocarbons or HFCs by 40 percent.

In the updated Scoping Plan, CARB recommends statewide targets of no more than 6 metric tons CO_2e per capita (statewide) by 2030 and no more than 2 metric tons CO_2e per capita by 2050. The statewide per capita targets account for all emissions sectors in the State, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer-term State emissions reduction goal of 80 percent below 1990 levels by 2050.

GHG Emissions

The U.S. EPA reported that in 2017, total gross nationwide GHG emissions were 6,457 MMT. These emissions were lower than peak levels of 7,370 MMT that were emitted in 2008. Relative to 1990 levels, these emissions were CARB updates the statewide GHG emission inventory on an annual basis where the latest inventory includes 2000 through 2017 emissions.[5] In 2017, GHG emissions from statewide emitting activities were 424 MMT. The 2017 emissions have decreased by 14 percent since peak levels in 2004 and are 7 MMT below the 1990 emissions level and the State's 2020 GHG limit. Per capita GHG emissions in California have dropped from a 2001 peak of 14.1 MT per person to 10.7 MT per person in 2017. The most recent Bay Area emission inventory was completed for the year 2011.[6] The Bay Area GHG emission were 87 MMT. As a point of comparison, statewide emissions were about 444 MMT in 2011.

California Green Building Standards Code

The 2016 California Green Building Standards Code (CALGreen Code) went into effect on January 1, 2017, and includes mandatory provisions applicable to all new residential, commercial, and school buildings. The intent of the CALGreen Code is to establish minimum statewide standards to significantly reduce the greenhouse gas emissions from new construction. The Code includes provisions to reduce water use, wastewater generation, and solid waste generation, as well as requirements for bicycle parking and designated parking for fuel-efficient and carpool/vanpool vehicles in commercial development. The code also requires mandatory inspections of building energy systems for non-residential buildings over 10,000 square feet to ensure that they are operating at their design efficiencies. It is the intent of the CALGreen Code that buildings constructed pursuant to the Code achieve at least a 15 percent reduction in energy usage when compared to the State's mandatory energy efficiency standards contained in Title 24. The Code also sets limits on VOCs

[5] CARB. 2019. *2019 Edition, California Greenhouse Gas Emission Inventory: 2000 – 2017*. Available at https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf accessed on Nov. 26, 2019.

[6] BAAQMD. 2015. *Bay Area Emissions Inventory Summary Report: Greenhouse Gases Base Year 2011*. January. Available at http://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf accessed Nov. 26, 2019.

(volatile organic compounds) and formaldehyde content of various building materials, architectural coatings and adhesives.

San Joaquin Valley Air Pollution Control District

In August 2008, the San Joaquin Valley Air Pollution Control District (SJVAPCD or Air District) adopted the Climate Change Action Plan (CCAP). The goals of the CCAP are to establish the Air District's processes for assessing the significance of project specific GHG impacts for projects permitted by the District; assist local land use agencies, developers, and the public by identifying and quantifying GHG emission reduction measures for development projects, and by providing tools to streamline evaluation of project specific GHG effects; ensure that collateral emissions from GHG emission reduction projects do not adversely impact public health or environmental justice communities in the Valley; and assist Valley businesses in complying with state law related to GHG emission reduction. In particular, the CCAP directed the SJVAPCD's Air Pollution Control Officer to develop guidance to assist Air District staff, Valley businesses, land use agencies, and other permitting agencies in addressing GHG emissions as part of the CEQA process. Pursuant to this directive, on December 17, 2009, SJVAPCD adopted *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA* (described below). The CCAP also directs Air District staff to investigate and develop a greenhouse gas banking program, enhance the existing emissions inventory process to include greenhouse gas emissions reporting consistent with new state requirements, and administer voluntary greenhouse gas emission reduction agreements.

SJVAPCD's Guidance for Addressing GHG Emissions Impacts under CEQA

Under its mandate to provide local agencies with assistance in complying with CEQA in climate change matters, the SJVAPCD developed its *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA.* As a general principal to be applied in determining whether a proposed project would be deemed to have a less-than-significant impact on global climate change, a project must be in compliance with an approved GHG emission reduction plan that is supported by a CEQA-compliant environmental document or be determined to have reduced or mitigated GHG emissions by 29 percent relative to Business-As-Usual conditions, consistent with GHG emission reduction targets established in ARB's Scoping Plan for AB 32 implementation. The SJVAPCD guidance is intended to streamline the process of determining if project specific GHG emissions would have a significant effect. The proposed approach relies on the use of performance-based standards and their associated pre-quantified GHG emission reduction effectiveness (Best Performance Standards, or BPS). Establishing BPS is intended to help project proponents, lead agencies, and the public by proactively identifying effective, feasible mitigation measures. Emission reductions achieved through implementation of BPS would be pre-quantified, thus reducing the need for project specific quantification of GHG emissions. For land use development projects, BPS would include emissions reduction credits for such project features as bicycle racks, pedestrian access to public transit, and so forth. However, these features do not provide meaningful reductions from gasoline dispensing facilities. Projects implementing a sufficient level of BPS would be determined to have a less-than-significant individual and cumulative impact on global climate change and would not require project specific quantification of GHG emissions. For all projects for which the lead agency has determined that an Environmental Impact Report is required, quantification of GHG emissions would be required

whether or not the project incorporates BPS. SJVAPCD's guidance document does not constitute a rule or regulation, but is intended for use by other agencies in their assessment of the significance of project impacts to global climate change under CEQA.

City of Manteca Climate Action Plan

The City of Manteca adopted the Climate Action Plan (CAP) in 2013 (Manteca 2013). The purpose of the CAP is to demonstrate the City's commitment to reduce GHG emissions. The CAP is intended to build upon existing efforts within the General Plan 2023.

The CAP provides a baseline emissions inventory for the community, provides forecasts and future year GHG reduction targets, develops a comprehensive set of strategies for reducing community-wide GHG emissions, and describes a set of guidelines for implementation, monitoring, and funding of GHG reduction strategies. The CAP aligns the City of Manteca with the Statewide GHG reduction requirements as set forth in AB32, SB375, and SB32, by providing GHG reduction strategies that are expected to reduce community-wide GHG emissions to 1990 levels by 2020. The State's current goal is to reduce GHG emissions by 40% below 1990 levels by 2030. The CAP sets a citywide target of a per capita GHG emission reduction of 21.7% from 1990 levels by 2020. The CAP plans to meet this target through energy efficiency and other GHG reduction measures in City buildings and operations, and by requiring development projects to reduce GHG emissions through measures such as designing energy-efficient structures, water conservation, implementing waste reduction measures, and implementing transportation demand management programs in commercial or industrial projects with large numbers of employees.

IMPACT ANALYSIS

STANDARDS OF SIGNIFICANCE

Appendix G, of the California Environmental Quality Act (CEQA) Guidelines (Environmental Checklist) contains a list of project effects that may be considered significant. The project would result in a significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations;
- Result in other emissions (such as those leading to odors) affecting a substantial number of people;
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant effect on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The SJVAPCD has developed the Guide for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015), also known as the GAMAQI. The following thresholds of significance,

obtained from the SJVAPCD's GAMAQI, are used to determine whether a proposed project would result in a significant air quality impact:

1) Construction Emissions of PM. Construction projects are required to comply with Regulation VIII as listed in the SJVAPCD; however, the size of the project and the proximity to sensitive receptors may warrant additional measures.

2) Criteria Air Pollutant Emissions. SJVAPCD current adopted thresholds of significance for criteria pollutant emissions and their application is presented in Table 4. These thresholds address both construction and operational emissions. Note that the District treats permitted equipment and activities separately. The project is not considered a source of SOx emissions and would have relatively low CO emissions.

3) Ambient Air Quality. Emissions that are predicted to cause or contribute to a violation of an ambient air quality would be considered a significant impact. SJVAPCD recommends that dispersion modeling be conducted for construction or operation when on-site emissions exceed 100 pounds per day after implementation of all mitigation measures.

4) Local CO Concentrations. Traffic emissions associated with the proposed project would be considered significant if the project contributes to CO concentrations at receptor locations in excess of the ambient air quality standards.

5) Toxic Air Contaminants or Hazardous Air Pollutants. Exposure to HAPs or TACs would be considered significant if the probability of contracting cancer for the Maximally Exposed Individual would exceed 20 in 1 million or would result in a Hazard Index greater than 1 for non-cancer health effects.

6) Odors. Odor impacts associated with the proposed project would be considered significant if the project has the potential to frequently expose members of the public to objectionable odors through development of a new odor source or placement of receptors near an existing odor source.

7) Greenhouse Gases (GHGs). In SJVAPCD's *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects Under CEQA*, the District establishes a requirement that land use development projects demonstrate a 29 percent reduction in GHG emissions from Business-As-Usual (BAU).

8) With respect to cumulative air quality impacts, the GAMAQI provides that any proposed project that would individually have a significant air quality impact (i.e., exceed significance thresholds for criteria pollutants ROG, NOx, or PM_{10}) would also be considered to have a significant cumulative impact. In cases where project emissions are all below the applicable significance thresholds, a project may still contribute to a significant cumulative impact if there are other projects nearby whose emissions would combine with project emissions to result in an exceedance of one or more significance thresholds for criteria pollutants.

TABLE 4 SJVAPCD Air Quality Thresholds of Significance – Criteria Pollutant Emission Levels in Tons Per Year

Pollutant/Precursor	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non-Permitted Equipment and Activities
Carbon Monoxide (CO)	100	100	100
Nitrogen Oxides (NOx)	10	10	10
Reactive Organic Gases	10	10	10
Sulfur Dioxide (SOx)	27	27	27
Particulate Matter – PM_{10}	15	15	15
Particulate Matter – $PM_{2.5}$	15	15	15
Source: San Joaquin Valley Air Pollution Control District, GAMAQI, Page 80, Table 2 or website at http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf.			

AIR QUALITY IMPACTS

Project-related air quality impacts fall into two categories: short-term impacts due to construction, and long-term impacts due to the proposed project operation. During construction, the proposed project would affect local particulate concentrations primarily due to fugitive dust sources and contribute to ozone and $PM_{10}/PM_{2.5}$ levels due to exhaust emissions. Over the long-term, the proposed project would result in an increase in emissions of ozone precursors such as ROG and NO_x, primarily due to increased motor vehicle trips (employee trips, site deliveries, and onsite maintenance activities).

Impact 1: Construction Dust. Construction activity involves a high potential for the emission of fugitive particulate matter emissions that would affect local air quality. This would be *less-than-significant* with implementation of Regulation VIII.

Construction activities would temporarily affect local air quality, causing a temporary increase in particulate dust and other pollutants. Dust emission during periods of construction would increase particulate concentrations at neighboring properties. This impact is potentially significant, but normally it can be mitigated.

The Project construction activities are anticipated to take place over an approximate 10-month period in 2021. Site preparation and disturbance (e.g., vehicle travel on exposed areas) would likely result in the greatest emissions of dust and $PM_{10}/PM_{2.5}$. Windy conditions during construction could cause substantial emissions of $PM_{10}/PM_{2.5}$.

The SJVAPCD's GAMAQI, emphasizes implementation of effective and comprehensive control measures. SJVAPCD adopted a set of PM_{10} fugitive dust rules collectively called Regulation VIII. This regulation essentially prohibits the emissions of visible dust (limited to 20-percent opacity) and requires that disturbed areas or soils be stabilized. Compliance with Regulation VIII during the construction phase of the proposed project would be required. Prior to construction of each project phase, the applicant would be required to submit a dust control plan that meets the regulation requirements. These plans are reviewed by SJVAPCD and construction cannot begin

until District approval is obtained. The provisions of Regulation VIII and its constituent rules pertaining to construction activities generally require:

- Effective dust suppression (e.g., watering) for land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill and demolition activities.
- Effective stabilization of all disturbed areas of a construction site, including storage piles, not used for seven or more days.
- Control of fugitive dust from on-site unpaved roads and off-site unpaved access roads.
- Removal of accumulations of mud or dirt at the end of the workday or once every 24 hours from public paved roads, shoulders and access ways adjacent to the site.
- Cease outdoor construction activities that disturb soils during periods with high winds.
- Record keeping for each day dust control measures are implemented.
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Landscape or replant vegetation in disturbed areas as quickly as possible.
- Prevent the tracking of dirt on public roadways. Limit access to the construction sites, so tracking of mud or dirt on to public roadways can be prevented. If necessary, use wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
- Suspend grading activity when winds (instantaneous gusts) exceed 25 mph or dust clouds cannot be prevented from extending beyond the site.

Anyone who prepares or implements a Dust Control Plan must attend a training course conducted by the District. Construction sites are subject to SJVAPCD inspections under this regulation. Compliance with Regulation VIII, including the effective implementation of a Dust Control Plan that has been reviewed and approved by the SJVAPCD, would reduce dust and PM_{10} emissions to a *less-than-significant* level.

Impact 2: Construction Emissions. Equipment and vehicle trips associated with construction would emit ozone precursors and particulate matter air pollutants on a temporary basis. Construction emissions would be below the GAMAQI significance threshold. This would be a *less-than-significant* impact.

Construction equipment exhaust effects air quality both locally and regionally. Emissions of DPM, a TAC, can affect local air quality. This impact is discussed under Impact 5. Emissions of air pollutants that could affect regional air quality were addressed by modeling emissions and comparing them to the SJVAPCD significance thresholds. Construction period air pollutant emissions were modeled using the California Emissions Estimator Model, CalEEMod 2016.3.2 model, with project construction information. This model was developed by the South Coast AQMD and other California Air Districts. SJVAPCD recommends the use of this model for construction and operational analysis of land use development projects. The model predicts emissions of ozone precursor pollutants (i.e., ROG and NO_x) and particulate matter (i.e., PM_{10} and $PM_{2.5}$).

The construction build-out scenario was developed based on the default assumptions assigned by CalEEMod for construction of the fueling facility as described in Table 5. The emissions computed by CalEEMod for this assessment address use of construction equipment, worker vehicle travel,

on-site vehicle and truck use, and off-site truck travel by vendors or equipment/material deliveries. Both criteria air pollutant exhaust and fugitive dust (i.e., PM_{10} and $PM_{2.5}$) were computed by CalEEMod. Note that the unmitigated CalEEMod modeling does not include the effects of SJVAPCD Regulation VIII that would substantially reduce fugitive PM_{10} and $PM_{2.5}$ emissions. *Attachment 1* includes the CalEEMod modeling outputs for construction and operational emissions.

TABLE 5 CalEEMod Inputs

Land Uses	Size	Metric	Lot Acreage
Gasoline/Service Station	20.00	Pump	2.02
Convenience Market (24 Hour)	4.80	1000sqft	0.00

Unmitigated and uncontrolled emissions from all phases of construction are reported in Table 6. As shown, unmitigated construction emissions would exceed the applicable SJVAPCD thresholds for PM_{10} in 2020 and 2021. Since the project could be constructed within an 18-month period over 2020-2021, the total emissions of NOx and PM_{10} (exhaust plus fugitive) would exceed the significance thresholds. Unless mitigated (and controlled under Regulation VIII and Rule 9510), this would represent a *significant* air quality impact.

The SJVAPCD Indirect Source Review Rule (Rule 9510) applies to construction of the proposed Project. Regardless of whether a project's construction emissions of regional pollutants would exceed the Air District's significance thresholds for each pollutant, the project is still required to comply with Rule 9510, to ensure that the project contributes its fair share of emissions reductions in order to achieve the basin-wide reduction targets established in the Air District's Ozone and PM attainment plans. Rule 9510 requires that the project reduce uncontrolled construction exhaust emissions by 20 percent for NO_x and 45 percent for PM_{10} from calculated unmitigated levels. The basis for the reductions is use of the CalEEMod emissions for statewide construction fleets. Use of newer equipment could result in substantially lower emissions. SJVAPCD encourages reductions through on-site mitigation measures. (Note: The use of the term "mitigation" under Rule 9510 does not refer to mitigation of impacts under CEQA; i.e., the ISR emission reduction percentages are required without regard to whether the CEQA emissions thresholds are exceeded or not.) Fees to purchase or sponsor off-site reductions through SJVAPCD apply when on-site mitigation measures do not achieve the required percentage of emissions reduction. Using less-polluting construction equipment, such as newer equipment or retrofitting older equipment reduces construction emissions on-site. A combination of on-site and off-site measures can be implemented to meet the overall emission reduction requirements. The emissions reported in Table 5 do not include the reductions required by Rule 9510.

TABLE 5 Uncontrolled Annual Construction Emissions in Tons per Year *

Construction Year	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
2021	0.30	**1.98**	1.79	**0.13**	0.11
Significance thresholds	10	10	100	15	15
Exceed Threshold?	No	No	No	No	No

* Values reported for PM_{10} and $PM_{2.5}$ include fugitive dust and diesel exhaust emissions combined. Fugitive dust emissions do not include the effect of measures implemented under Regulation VIII or required by the City of Manteca.

Mitigation Measure AQ-1: All off-road diesel construction equipment greater than 25 horsepower and operating at the site for more than 20 hours shall meet U.S. EPA Tier 4 engine standards.

Effectiveness of Mitigation

From a CEQA perspective, mitigation is not required for this impact but will be required under Impact x and this measure would reduce emissions in accordance with SJVAPCD's Indirect Source Review Rule (Rule 9510). Implementation of SJVAPCD Regulation VIII and Mitigation Measure AQ-1 would reduce NOx emissions by over 30 percent and PM10 emissions by over 75 percent. It was previously noted that under Rule 9510 (ISR), the project would be responsible for reducing construction PM_{10} emissions by 45 percent, and NOx emissions by 20 percent. These reductions are required regardless of whether the project emissions exceed the CEQA significance thresholds. This CEQA analysis does not account for ISR reductions, as they are treated separately by the SJVAPCD. (However, it appears that the reductions in emissions that would result from implementation of *Mitigation Measure AQ-1* would meet the ISR emissions reduction requirements.) The final emissions calculations for the project will be performed in an Air Impact Assessment (AIA), as required under ISR to determine the specific ISR reductions (i.e., in tons) that will be required for the project.

Impact 3: Operational Emissions. Proposed Project operational emissions, generated primarily by traffic and evaporation of gasoline vapors, would increase emissions of ozone precursors and particulate matter, but they would be below GAMAQI significance thresholds. These increases would be *less-than-significant*.

The CalEEMod model was also used to estimate annual emissions from operation of the Project. The first full year that the project could be operational is 2022 and was used as the analysis year. Emissions were modeled and evaluated two ways: (1) emissions from land use (e.g., project traffic generation) and (2) emissions from sources subject to SJVAPCD permitting for stationary sources.

Emissions from Sources Not Subject to Specific SJVAPCD Permits

The effect of the project operations on regional air quality was evaluated by quantification of emissions for operating scenarios in 2022 and comparing said emissions to the SJVAPCD

thresholds of significance provided in Table 4. As described previously, the CalEEMod model was also used to quantify annual emissions from the project, once construction is completed and the project is operational. In addition to emissions from transportation sources, the CalEEMod model also predicts emissions from area sources, such as natural gas usage, consumer products, and landscape equipment. Area sources include ROG emissions from use of consumer products and architectural coatings. ROG emissions from GDF operations are permitted by SJVAPCD and are addressed separately below.

Inputs to the CalEEMod model for air pollutant modeling are based on default conditions for San Joaquin County with the following adjustments:

1. Project traffic trip generation estimates were input that include 4,107 daily vehicle trips
2. The vehicle fleet mix was adjusted to only include 2 percent heavy-duty trucks, rather than the county default of 7 percent.

The annual non-permitted emissions associated with the project are shown in Table 6. As shown in the table, the project emissions would not exceed the applicable significance thresholds for ROG, NO_x, and PM_{10}.

As previously mentioned, the project is subject to SJVAPCD's ISR Rule 9510 to reduce NO_x and PM_{10} emissions. Although the project's operational emissions of regional pollutants would not exceed the District's significance thresholds for each pollutant, as shown in Table 6, the project is still required to comply with Rule 9510, to ensure that the project contributes its share of emissions reductions in order to achieve the basin-wide reduction targets established in the Air District's Ozone and PM_{10} attainment plans. Under Rule 9510, the project would be required to reduce operational NO_x emissions by 33 percent and operational PM_{10} emissions by 50 percent over 10 years. The emissions in Table 6 do not reflect any reductions that may be required under ISR.

Emissions from Sources Subject to SJVAPCD Permits

Gasoline Dispensing Facilities

GDFs are regulated by the SJVAPCD. The project includes one 16-position gasoline dispensing facility (GDF). Because GDFs require permits from the Air District (unlike other "unpermitted" operational sources discussed earlier), emissions attributed to the GDF were estimated separately from the area source operational emissions above. The emissions calculations are based on annual throughput (i.e., fuel received and dispensed) anticipated for the facility. The project estimates a daily throughput of 13,000 gallons, which equates to 4.745 million gallons per year. In addition to traffic-related emissions, the GDF is also a source of ROG emissions associated with loading, storage, refueling of vehicles and spillage that results in evaporative emissions. Table 6 also presents the evaporative ROG emissions associated with the proposed GDF. As shown in the table, the ROG emissions from the proposed GDF would not exceed the SJVAPCD's applicable significance thresholds for permitted stationary sources. Note that SJVAPCD emissions thresholds are applied separately for permitted and non-permitted emissions.

Emergency Backup Generators

Another potential source of operational emissions is stationary equipment such as diesel engines used to power emergency back-up generators. Typically, commercial retail projects do not include stationary equipment, and other than the proposed GDF, no other stationary source equipment has not been identified as part of the project at this time. There is the possibility that the project facility could include sources of combustion emissions, such as a small standby generator operated by diesel or natural gas. These stationary sources would be subject to SJVAPCD rules and regulations and could require permits from SJVAPCD. The SJVAPCD's permitting process requires the purchase of emission reduction credits (ERC) for any criteria pollutant exceeding the SJVAPCD's New Source Review (NSR) offset requirements. NSR offset requirements provide the basis for the SJVAPCD CEQA thresholds of significance. As such, sources of stationary air pollutant emissions will be required to comply with all applicable SJVAPCD regulations thereby resulting in a less than significant air quality impact.

TABLE 6 Annual Project Operational Emissions in Tons Per Year

Project	ROG	NO_x	CO	PM_{10}[1]	$PM_{2.5}$[1]
Non-Permitted Operations	0.72	1.42	4.36	0.72	0.20
Significance Thresholds	*10*	*10*	*100*[2]	*15*	*15*
Permitted Sources	*2.25*	*0*	*0*	*0*	*0*
Significance Thresholds	*10*	*10*	*100*[2]	*15*	*15*
Exceed Thresholds?	No	No	No	No	No

[1]Includes both exhaust and fugitive dust emissions.
[2]Significant if emissions exceed 100 tons per year and then contribute to violation of the NAAQS/CAAQS

Mitigation Measure for Impact 3: None Required

Impact 4: Carbon monoxide concentrations from operational traffic. Mobile emissions generated by project traffic would increase carbon monoxide concentrations at intersections in the project vicinity. However, resulting concentrations would be below ambient air quality standards, and therefore, considered a *less-than-significant* impact.

Project traffic would slightly increase concentrations of CO along roadways providing access to the project. Carbon monoxide is a localized air pollutant, where highest concentrations are found very near sources. The major source of CO is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volume and congestion.

Emissions and ambient concentrations of CO have decreased greatly in recent years. These improvements are due largely to the introduction of cleaner burning motor vehicles and reformulated motor vehicle fuels. No exceedances of the State or federal CO standards have been recorded at any of San Joaquin Valley's monitoring stations in the past 15 years. The San Joaquin Valley Air Basin has attained the State and National CO standards.

Localized CO concentrations are addressed through the SJVAPCD screening method that can be used to determine with fair certainty that the effect a project has on any given intersection would

not cause a potential CO hotspot. A project can be said to have no potential to create a CO violation or create a localized hotspot if either of the following conditions are not met: level of service (LOS) on one or more streets or intersections would be reduced to LOS E or F; or the project would substantially worsen an already LOS F street or intersection within the project vicinity. As the proposed project will not do either of these, the potential impact on CO would be considered *less-than-significant*.

Mitigation Measure for Impact 4: None Required

Impact 5: Exposure of Sensitive Receptors to Toxic Air Contaminants. Construction activity, delivery trucks, operational traffic and evaporative emissions from the GDF would expose nearby receptors to toxic air contaminants. Based on the levels of construction toxic air contaminants and the distance to the nearest sensitive receptor, a health risk assessment to assess the potential cancer risk was conducted and found would be *less-than-significant with Mitigation.*

To evaluate the exposure of sensitive receptors to emissions of Toxic Air Contaminants (TACs) from the project, a health risk assessment of both project construction activities and emissions from project operation was conducted. The health risk assessment predicts lifetime cancer risk and non-cancer risks. The health risk assessment involves prediction of emissions from the various sources of TACs, dispersion modeling using historical meteorological data and calculation of health risks using SJVAPCD recommended risk assessment methods for infant, child, and adult exposures for residential receptors, and for off-site worker exposure. These methods are described in *Attachment 2*.

Construction Health Risk Impacts

Construction activity is anticipated to include site preparation and grading, trenching/excavation, building construction, paving and some application of architectural coatings. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a TAC. This health risk assessment focused on modeling on-site construction activity using emissions computed using CalEEMod, as described under Impact 2. Construction of the project is expected to occur over about a 9- to 10-month period assumed to occur in 2021.

Construction Emissions

The CalEEMod model provided unmitigated total annual PM_{10} exhaust emissions (assumed to be diesel particulate matter) for the off-road construction equipment and for exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles), with total DPM exhaust emissions of 0.0993 tons (199 pounds) in 2021. The construction DPM emissions include on-road emissions resulting from haul truck travel during grading activities, worker travel, and vendor deliveries during building construction, with overall trip lengths of 1.0 mile to simulate travel on and near the site. A summary of the on-site CalEEMod model output with emission calculations are provided in *Attachment 2*.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to model concentrations of DPM at existing sensitive receptors in the vicinity of the project site. The AERMOD modeling utilized an area source to represent the location of on-site construction activities. Emissions were distributed evenly across the area source. To represent the construction equipment exhaust emissions, an emission release height of 6 meters (20 feet) was used for the area sources. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. Emissions from on-road truck travel at and near the project site were included in the area source. Emissions were modeled as occurring daily between 7 am - 4 pm, when the majority of construction activity would occur. Figure 2 shows the project site and nearby sensitive receptor locations (residential and worker) where health impacts were evaluated.

The model used a 5-year data set (2013-2017) of hourly meteorological data from Stockton Metropolitan Airport prepared for use with the AERMOD model by the SJVAPCD. The airport is about 7 miles north of the project site. DPM concentrations were calculated at nearby sensitive receptors using a receptor height of 1.5 meters (4.9 feet). Since there is negligible elevation difference between the source and receptors and since the receptors with the highest modeled concentrations are close to the emission area flat terrain was used for the modeling. Rural dispersion conditions were used in the modeling since the area surrounding the project site is predominantly non-urban.

Construction Cancer Risk and Hazards

The maximum-modeled unmitigated (uncontrolled) annual DPM concentration occurred at a residential receptor east of the project site. The location where the maximum impact occurred is identified on Figure 2. Increased cancer risks were calculated using the modeled annual concentrations and SJVAPCD recommended risk assessment methods for infant, child, and adult exposures for residential receptors, and for off-site worker exposure. Table 7 reports the health risk impacts associated with construction activities at the various sensitive receptor types near the project. Results of this assessment indicate that, with project construction, the maximum increased infant cancer risk at the maximally exposed residential individual location would be 46.4 in one million and the maximum residential adult incremental cancer risk would be 1.1 in one million. The maximum off-site worker cancer risk would be 2.6 in one million. The predicted increased cancer risk for a residential exposure would be greater than the SJVAPCD significance threshold of 20 in one million. The maximum increased cancer risk for a worker exposure would be below the SJVAPCD significance threshold for cancer risk. With *Mitigation Measure AQ-1* the mitigated increased project residential cancer risk would not exceed the cancer risk significance threshold.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. The chronic inhalation reference exposure level (REL) for DPM is 5 $\mu g/m^3$. The Hazard Index (HI), which is the ratio of the annual DPM concentration to the REL, is less than 0.1 at all receptor locations. This HI is much lower than the SJVAPCD significance criterion of a HI greater than 1.

Figure 2 – Project Site and Sensitive Receptor Locations

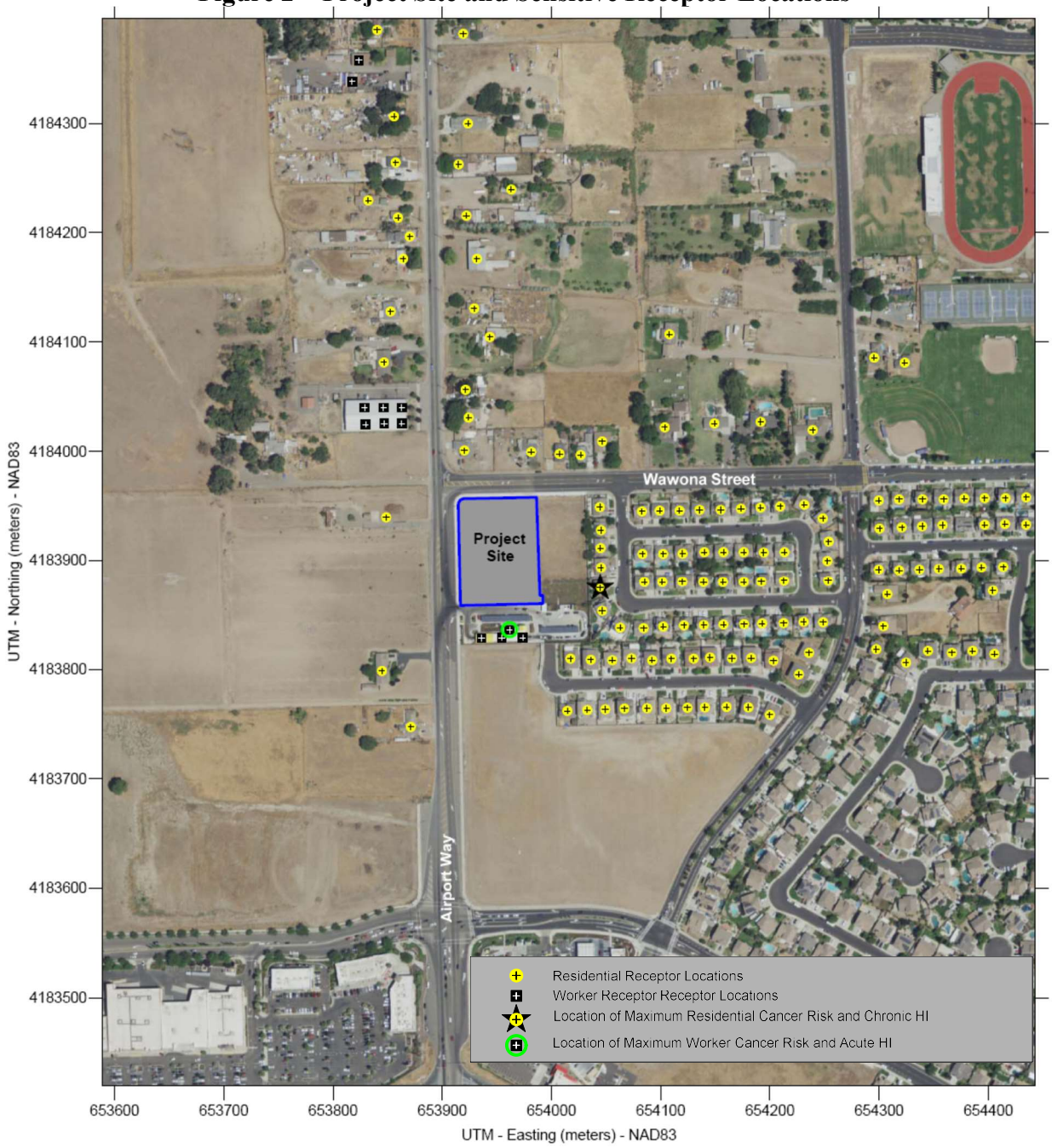


TABLE 7. Construction Period Health Risk Impacts

Receptor	Health Risk Impact	
	Increased Cancer Risk (per million)	Hazard Index
Residential – infant		
Unmitigated	**46.4**	0.05
Mitigated	8.8	<0.01
Residential – adult		
Unmitigated	1.1	0.05
Mitigated	0.2	<0.01
Off-Site Worker		
Unmitigated	2.6	0.05
Mitigated	0.5	<0.01
SJVAPCD Threshold	*>20.0*	>1.0
Exceed Threshold? Unmitigated/Mitigated	***Yes****/No*	*No/No*

Operation Health Risk Impacts

Local traffic generated by the project along with evaporative emissions from gasoline storage and fueling could lead to operational community risk impacts. Storage and fueling emissions from diesel fuel are expected to be minimal. Specific sources of emissions include customer traffic traveling to and from the project site, fuel delivery truck traffic traveling to an from the site, fuel delivery truck idling while at the site, and evaporative emissions of fuel from transfer and storage of gasoline (i.e., underground tank filling, tank breathing and vehicle fueling and spillage). Impacts from each of these sources are addressed. These sources are assumed to be operational well into the future (i.e., 70 years). The year 2022 was assumed to be the first full year of operation and was used as the year of analysis for generating emission rates. Vehicle emission rates are anticipated to decrease in the future due to improvements in exhaust systems and turnover of the fleet from older, more polluting vehicles, to newer cleaner vehicles.

Project Traffic-Related Emissions

Daily traffic generation was calculated as 4,107 total trips per day based on a gasoline/service station with 20 vehicle fueling positions.[7] It was estimated that about 56 percent of these trips would be pass-by trips. This means the vehicles are already traveling by or near the project site. However, to be conservative, this analysis assumes these trips are all new to the project site. The distribution of customer vehicle trips on the local roads (S. Airport Way and Wawona Street) and station access was based on the traffic report for the project.[8] The number of fuel delivery trucks visiting that station were estimated as 1,060 trucks per year based on a total station fuel use of 4,745,000 gallons per year. All fuel delivery trucks were assumed to be heavy duty diesel fueled trucks (HDT). These trucks were assumed to arrive at the station via S. Airport Way, travel to the underground fuel tank storage area, unload their fuel, and then depart the station via S. Airport

[7] Rotten Robbie Service Station Report. 2020. Rotten Robbie Fuel Station Project, Transportation Impact Analysis Report. March

[8] Ibid.

Way. The number of customer heavy duty diesel trucks accessing the station was estimated to be 8.1 percent of the daily customer vehicle trips based on data from Caltrans for San Joaquin County.[9] The customer HDT trucks were assumed to take the same route to the fuel station as the fuel delivery trucks. Customer vehicles, customer HDT trucks, and fuel delivery trucks were assumed to travel at a speed of 25 mph off site and 5 mph while in the station are.

The primary TAC of concern from the fuel delivery trucks and customer HDT trucks is DPM, while for other customer vehicles the TACs of concern are MSATs, as previously described. TAC emissions for project vehicles were calculated using emission factors from the Caltrans version of the EMFAC2017 emissions model, known as CT-EMFAC2017[10], and the increased local project-related traffic described above. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and MSATs, including DPM. Emission processes modeled include running exhaust, running evaporative losses for organic MSATs, tire and brake wear and fugitive road dust. DPM emissions are projected to decrease in the future and are reflected in the CT-EMFAC2017 emissions data. Inputs to the model include region (i.e., San Joaquin County), type of road, traffic mix assigned by CT-EMFAC2017 for the county, year of analysis, and season.

Project operation was assumed to begin in 2022 or thereafter. In order to estimate MSAT emissions from project vehicles over a 70-year exposure period for calculating increased cancer risks to existing nearby residents and workers from project traffic, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2022. Year 2022 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated (70 years), since, as discussed above, overall vehicle emissions will decrease in the future. Emission factors from the CT-EMFAC2017 model for travel speeds of 25 mph and 5 mph were used in calculating project vehicle emissions while traveling off-site and on-site, respectively. Emissions were assumed to occur 24-hours per day, 365 days per year. MSAT emission rates used in the analysis are provided in *Attachment 3*.

Idling Emissions - Fuel Delivery Trucks

Idling emissions due to customer vehicles queuing and fuel delivery trucks idling were computed using the 5 mph emission factor from the CT-EMFAC2017 model. Idle emissions from fuel delivery truck while at the fuel station were computed by converting 5 mile-per hour emissions rates into hourly emissions. All fuel delivery trucks were assumed to idle for a total of 15 minutes while at the station. Annual emissions assumed similar operating conditions 365 days per year. The analysis of idling emissions is included in *Attachment 3*.

Fueling Emissions

The transfer and storage of gasoline results in emissions of VOCs and organic TAC compounds including benzene, ethyl benzene, toluene, and xylenes (BETX). Emissions of VOCs and BETX were computed based on projected annual throughput of gasoline (i.e., 4.745 million gallons) using

[9] Percentage of HDT in San Joaquin Co. in 2022 from the CTEMFAC2017 model

[10] California Department of Transportation. 2019. CT-EMFAC2017 User Guide. January.

a Gasoline Dispensing Operations VOC Calculator spreadsheet provided by the SJVAPCD.[11] The emission are based on annual gasoline throughput and account for emissions from fuel storage tank loading and pressure driven (breathing) losses, motor vehicle refueling, and fuel spillage while refueling. A*ttachment 3* includes emissions calculation of VOC and BTEX emissions from gasoline fueling, storage, and transfer.

Dispersion Modeling

The US EPA AERMOD dispersion model was used to predict DPM and other TAC concentrations at existing sensitive receptors (residences) and worker receptors in the vicinity of the project site. The AERMOD dispersion model is a SJVAPCD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.[12] The modeling used the same meteorological data from the Stockton Municipal Airport as previously discussed for the construction health risk modeling. TAC concentrations from on-site and off-site emission sources were calculated at nearby residences and off-site worker locations using a receptor height of 1.5 meters (4.9 feet). Since there is negligible elevation difference between the modeled sources and receptors, flat terrain was used for the modeling.

On-site emission sources include customer vehicles and HDT trucks, fuel delivery trucks, fuel delivery truck idling, and gas station fueling and spillage, and the vent stack for fuel storage tank emissions. Off-site emission sources include customer and fuel delivery vehicle travel routes. The modeled emission sources and receptors where TAC concentrations were calculated are shown in Figure 3. Truck and customer vehicle travel emissions were modeled as line sources (a series of volume sources along a line) representing off-site and on-site travel routes depicted in Figure 3. Vehicle volume source modeling parameters were based on EPA[13] and SJVAPCD[14] recommended volume source parameters. The idle emissions from fuel trucks were modeled as point sources using default values recommended by the SJVAPCD[15].

BETX emissions from refueling and spillage in the gas dispensing area at the fuel station were modeled using volume sources and parameters recommended by the SJVAPCD. Three volume sources with side lengths of 6.5 meters and a 1-meter height were used for vehicle refueling emissions and three volume sources with side lengths of 6.5 meters and a 0-meter height were used for spillage emissions. BETX emissions from storage tank loading and breathing losses are discharged from vent pipes located in near the underground storage tank area and were modeled

[11] San Joaquin Valley Air Pollution Control District. 2020. Email from Kyle Melching of the SJVAPCD and James Reyff of Illingworth & Rodkin, Inc. on February 6, 2020.

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[12] San Joaquin Valley Air Pollution Control District, Guidance for Air Dispersion Modeling, Draft 01/07 Rev 2.0

[13] US EPA. 2015. Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas. November 2015

[14] San Joaquin Valley Air Pollution Control District. 2018. SJVAPCD Memo FYI – 366 Estimating and Modeling Emissions from Truck Travel and Idling. May 24, 2018.

[15] Ibid

as point sources. Details on the emission calculations and dispersion modeling information for these sources are provided in *Attachment 3*.

Cancer Risk and Hazards

Using the maximum modeled TAC concentrations, total increased cancer risks from project construction and operation were computed using the most recent methods recommended by SJVAPCD and OEHHA that include nearly continuous exposures with adjustments for infants and children. Based on modeled TAC concentrations, cancer risks were calculated for 70-year residential exposures and 40-year worker exposures assuming one year of emissions from construction in 2021 and constant operational emissions for the remainder of the exposure periods at 2022 operation levels.

Table 8 shows the increased health risk impacts attributable to only operation of the project. Operation of the project includes the effects of project generated traffic on-site and traveling nearby, project truck deliveries and evaporative emissions from the GDF.

TABLE 8. Project Operation Maximum Health Risk Impacts

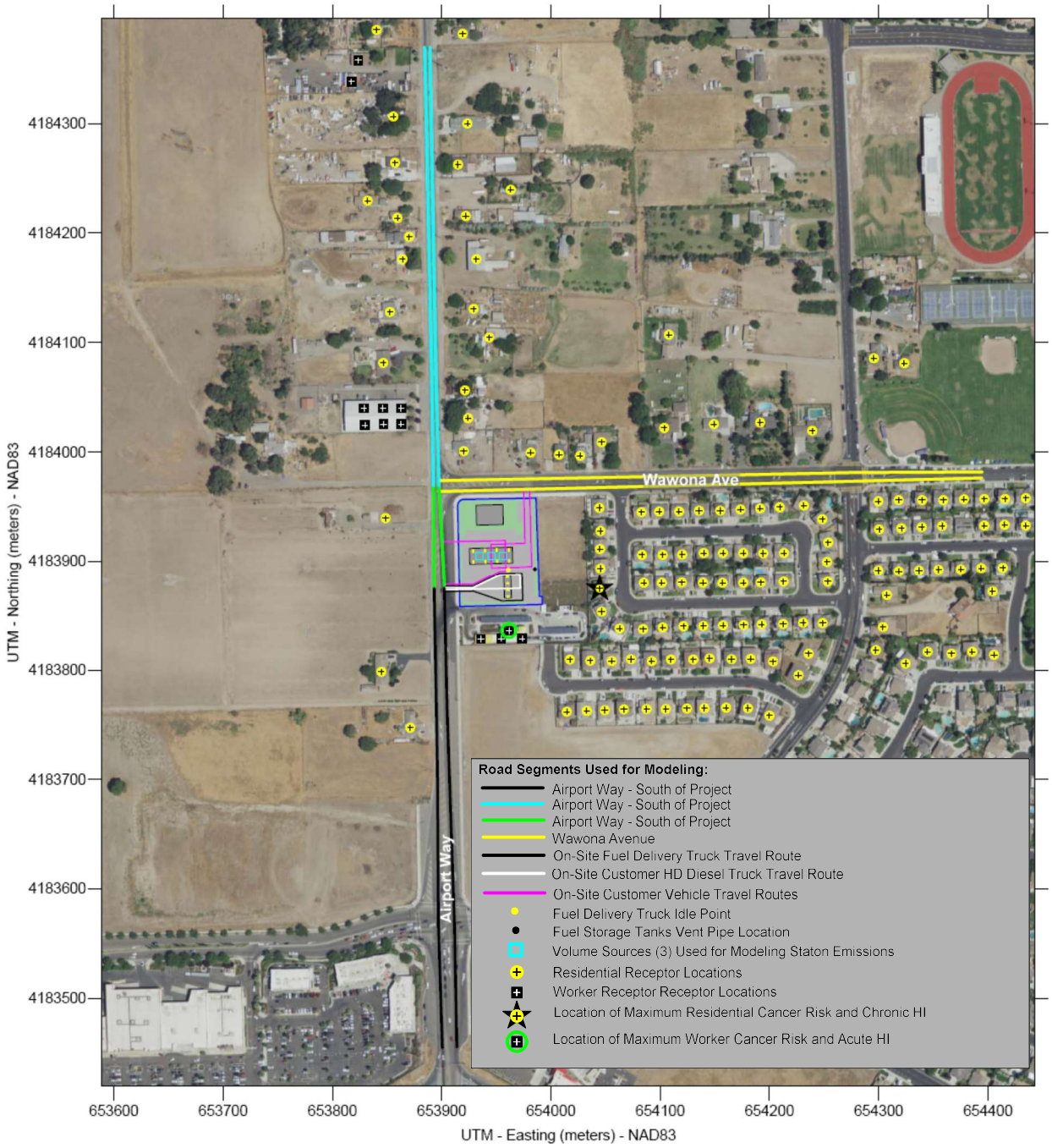
Receptor	Increased Cancer Risk (per million)	Acute Hazard Index	Chronic Hazard Index
Residential	10.8	0.11	0.03
Off-Site Worker	1.5	0.11	0.03
SJVAPCD Threshold	*>20.0*	>1.0	>1.0
Exceed Threshold?	*No*	*No*	*No*

Table 9 shows the increased cancer risks and acute or chronic hazards associated with the project construction and operation at the locations of residential and off-site worker exposures. The maximum excess cancer risk associated with project construction and operation would be 4.2 chances per million. The predicted Hazard Index is well below the significance threshold.

Table 9. Project Construction and Operation Maximum Health Risk Impacts

Receptor	Increased Cancer Risk (per million)	Acute Hazard Index	Chronic Hazard Index
Residential			
With Unmitigated Construction	**55.4**	0.11	0.05
Mitigated	17.7	0.11	0.01
Off-Site Worker			
Unmitigated	4.0	0.11	0.05
Mitigated	1.9	0.11	0.01
SJVAPCD Threshold	*>20.0*	>1.0	>1.0
Exceed Threshold?			
Unmitigated/Mitigated	***Yes****/No*	*No/No*	*No/No*

FIGURE 3. Project Site, Sensitive Receptor Locations, and Modeled On-Site Emission Sources



Mitigation Measure for Impact 5: Implement **Mitigation Measure AQ-1**.

All off-road diesel construction equipment greater than 25 horsepower and operating at the site for more than 20 hours shall meet U.S. EPA Tier 4 engine standards.

Effectiveness of Mitigation

CalEEMod modeling indicates that implementation of Mitigation Measure AQ-1 would reduce exhaust PM10 emissions, considered to be equivalent to DPM emissions, by 80 percent. The reductions in construction period emissions would reduce the construction period cancer risk for residents to 8.8 chances per million. This level is below the significance threshold of 20 chances per million. When combined with operation emissions, the overall project cancer risk would be 17.7 chances per million.

Impact 6: Odors. The project would result in temporary odors during construction. This impact would be *less-than-significant*.

During construction, the various diesel powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and not likely to be noticeable for extended periods of time much beyond the project's site boundaries. The potential for diesel odor impacts is, therefore, *less-than-significant*.

During project operations, the project is not expected to generate any objectionable odors. Therefore, the odor impacts associated with operations would be *less-than-significant*.

Mitigation Measure for Impact 6: None proposed.

Impact 7: Consistency with Clean Air Planning Efforts. The project would not conflict with the current clean air plan or obstruct its implementation. This would be a *less-than-significant impact*.

The GAMAQI does not include methodologies for assessing the effect of a project on consistency with clean air plans developed by the SJVAPCD. Regional clean air plans developed by SJVAPCD rely on local land use designations to develop population and travel projections that are the basis of future emissions inventories. Air pollution control plans are aimed at reducing these projected future emissions. The project land uses would not alter population and vehicle related emissions projections contained in regional clean air planning efforts in any measurable way, and would not conflict with achievement of the control plans aimed at reducing these projected emissions. Therefore, the project would not conflict with or obstruct implementation of efforts outlined in the region's air pollution control plans to attain or maintain ambient air quality standards. This would be a *less-than-significant* impact.

Also, as discussed above, in 2005 the SJVAPCD adopted the ISR Rule in order to fulfill the District's emission reduction commitments in its PM_{10} and Ozone attainment plans. The District has determined that implementation and compliance with the ISR would reduce the cumulative PM_{10} and NO_X impacts of growth anticipated in the air quality plans to a less-than-significant level. Since the project would be required to implement the emissions reductions under ISR, it would fulfill its share of achieving the District's emission reduction commitments in the PM_{10} and Ozone

attainment plans. Therefore, the project would result in a *less-than-significant impact* since it would not conflict with or obstruct implementation of the applicable air quality plans.

Mitigation Measure for Impact 7: None required.

Computation of Greenhouse Gas Emissions

This section provides a computation of greenhouse gases (GHG) emissions associated with the project. GHG emissions are from many sources over long periods of time has resulted in, and continues to contribute to, global warming and climate change. The effects of climate change include: melting polar ice caps, sea level rise, increased coastal flooding, increased frequency and severity of extreme weather events, habitat disruption, and other adverse environmental effects. It is generally accepted that individual development projects, in and of themselves, are too small to have a perceptible effect on global climate. However, the GHG emissions from each development project results in an incremental contribution to global warming and climate change. The geographic scope of climate change is global, and the cumulative emissions of GHGs globally have resulted in cumulatively significant climate change impacts. Thus, in CEQA terms, GHG emissions associated with individual development projects are by nature cumulative in their effects. A significant project impact would occur if the GHG emissions associated with a project represent a considerable contribution to the cumulatively significant impacts resulting from global climate change. As such, the focus of this analysis is to determine whether the GHG emissions associated with the project represent a considerable contribution to the cumulatively significant impacts resulting from global climate change. For purposes of this analysis, the cumulatively contribution is considered a significant adverse impact.

SJVAPCD Methodologies

The SJVAPCD's (Air District) *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA* provides for three alternative methodologies for evaluating project's potential impact on climate change and determination reducing the greenhouse gas emissions from a project to less-than-significant levels. These include: (1) Demonstrate compliance with a locally-adopted GHG reduction plan (i.e., Climate Action Plan); (2) Demonstrate implementation of a combination of Air District-approved and pre-qualified Best Performance Standards (BPS) which taken together are deemed to result in a 29 percent reduction in project GHG emissions relative to Business-As-Usual (BAU) conditions; or (3) For projects not implementing BPS, quantification of project GHG emissions and comparison to GHG emissions from BAU conditions in order to demonstrate a 29 percent reduction in emissions relative to BAU conditions. BAU is defined as operation of the proposed project with emission factors from the 2002-2004 baseline period established by the AB 32 Scoping Plan. Land use projects not achieving the necessary reductions would be considered to have a significant impact. It is important to note that projects that require the preparation of an EIR for any reason are required to quantify GHG emissions, even if compliant with an adopted climate action plan or implementing BPS.

CalEEMod Modeling

CalEEMod was used to quantify GHG emissions from project operations-related activities assuming full build-out of the project in 2022. The project land use types and size and other project-specific information were input to the model. The use of this model for evaluating emissions from land use projects is recommended by the Air District. Unless otherwise noted below, the CalEEMod model defaults for San Joaquin County were used. CalEEMod provides emissions for transportation, areas sources, electricity consumption, natural gas combustion, electricity usage associated with water usage and wastewater discharge, and solid waste land filling and transport. CalEEMod output worksheets are included in *Attachment 1*.

The project land use types and size, and trip generation rate were input to CalEEMod, as described above under Impact 1 and 2.

Energy

Energy usage emissions include those from natural gas combustion and electricity usage. CalEEMod model default energy usage inputs were used in the modeling. The CalEEMod default values for energy were used.

Construction Emissions

Annual GHG emissions associated with construction were computed at 265 metric tons (MT) of CO_2e. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the County nor SJVAPCD have an adopted threshold of significance for construction-related GHG emissions. However, other air districts, such as the South Coast Air Quality Management District, account for construction GHG emissions by amortizing them over a 30-year period, i.e., adding $1/30^{th}$ of construction emissions to annual operational emissions. This amortization method was applied in the calculation of project GHG emissions.

Operational Emissions

The CalEEMod model predicted annual emissions associated with operation of the fully-developed project. In 2023, annual emissions resulting from operation of the proposed project are calculated to be 850 MT of CO_2e, as shown in Table 10.

TABLE 10. Annual Project GHG Emissions (CO_2e) in Metric Tons

Source Category	BAU Emissions	2025 Project Emissions
Amortized Construction	9	9
Area	0	0
Energy Consumption	29	13
Mobile	1050	814
Solid Waste Generation	13	13
Water Usage	2	2
Total	1,094	850
Percent Reduction		22.3 percent
SJVAPCD Reduction Target for Project-Specific Emissions (for Projects not compliant with a CAP or not implementing BPS)		**29 percent**

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Attachment 1: CalEEMod Modeling Output

Rotten Robbie GDF in Manteca

San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Convenience Market (24 Hour)	4.80	1000sqft	0.00	4,800.00	0
Gasoline/Service Station	20.00	Pump	2.02	2,823.50	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	51
Climate Zone	2			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	210	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 rate

Land Use - 16 gas + 4 diesel. Added land use for market

Construction Phase - default schedule without demolition. PD = 10-months

Off-road Equipment - added trenching equipment

Trips and VMT - Local traffic only

Grading - Assume some base rock imported and some trenched material exported

Vehicle Trips - Traffic predicts 4,107 daily with 56% passby and 31% diverted = 205.35/77.38/63.16

Construction Off-road Equipment Mitigation - BMPs plus Tier 4

Fleet Mix - only 2% large trucks

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblFleetMix	LDT1	0.04	0.04
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tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	4.6870e-003	4.9320e-003
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tblFleetMix	MDV	0.12	0.13
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tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	1.1900e-003	1.2520e-003
tblFleetMix	SBUS	6.1000e-004	6.4200e-004
tblFleetMix	UBUS	1.4530e-003	1.5290e-003
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialImported	0.00	500.00
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tblVehicleTrips	PB_TP	59.00	56.00
tblVehicleTrips	PR_TP	14.00	13.00
tblVehicleTrips	ST_TR	863.10	0.00
tblVehicleTrips	ST_TR	168.56	77.38
tblVehicleTrips	SU_TR	758.45	0.00
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2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.2986	1.9812	1.7856	3.1500e-003	0.0270	0.0994	0.1263	0.0117	0.0949	0.1066	0.0000	263.6221	263.6221	0.0531	0.0000	264.9490
Maximum	**0.2986**	**1.9812**	**1.7856**	**3.1500e-003**	**0.0270**	**0.0994**	**0.1263**	**0.0117**	**0.0949**	**0.1066**	**0.0000**	**263.6221**	**263.6221**	**0.0531**	**0.0000**	**264.9490**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1106	1.3525	1.9034	3.1500e-003	9.8500e-003	0.0189	0.0287	3.6600e-003	0.0189	0.0225	0.0000	263.6218	263.6218	0.0531	0.0000	264.9487
Maximum	**0.1106**	**1.3525**	**1.9034**	**3.1500e-003**	**9.8500e-003**	**0.0189**	**0.0287**	**3.6600e-003**	**0.0189**	**0.0225**	**0.0000**	**263.6218**	**263.6218**	**0.0531**	**0.0000**	**264.9487**

	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	**62.96**	**31.74**	**-6.60**	**0.00**	**63.51**	**80.99**	**77.25**	**68.69**	**80.10**	**78.85**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2021**	**3-31-2021**	0.6598	0.4061
2	**4-1-2021**	**6-30-2021**	0.5913	0.3779

3	**7-1-2021**	**9-30-2021**	0.5978	0.3820
		Highest	0.6598	0.4061

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0351	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.7000e-004
Energy	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	13.4687	13.4687	1.1700e-003	3.3000e-004	13.5949
Mobile	0.6892	1.4170	4.3588	8.9200e-003	0.7147	9.2200e-003	0.7239	0.1911	8.5800e-003	0.1997	0.0000	812.3240	812.3240	0.0493	0.0000	813.5556
Waste						0.0000	0.0000		0.0000	0.0000	5.1174	0.0000	5.1174	0.3024	0.0000	12.6782
Water						0.0000	0.0000		0.0000	0.0000	0.1971	0.4471	0.6442	0.0203	4.9000e-004	1.2980
Total	**0.7249**	**1.4224**	**4.3635**	**8.9500e-003**	**0.7147**	**9.6300e-003**	**0.7243**	**0.1911**	**8.9900e-003**	**0.2001**	**5.3145**	**826.2403**	**831.5548**	**0.3732**	**8.2000e-004**	**841.1272**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0351	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.7000e-004
Energy	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	13.4687	13.4687	1.1700e-003	3.3000e-004	13.5949
Mobile	0.6892	1.4170	4.3588	8.9200e-003	0.7147	9.2200e-003	0.7239	0.1911	8.5800e-003	0.1997	0.0000	812.3240	812.3240	0.0493	0.0000	813.5556

Waste						0.0000	0.0000		0.0000	0.0000	5.1174	0.0000	5.1174	0.3024	0.0000	12.6782
Water						0.0000	0.0000		0.0000	0.0000	0.1971	0.4471	0.6442	0.0203	4.9000e-004	1.2980
Total	**0.7249**	**1.4224**	**4.3635**	**8.9500e-003**	**0.7147**	**9.6300e-003**	**0.7243**	**0.1911**	**8.9900e-003**	**0.2001**	**5.3145**	**826.2403**	**831.5548**	**0.3732**	**8.2000e-004**	**841.1272**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2021	1/5/2021	5	3	
2	Grading	Grading	1/6/2021	1/13/2021	5	6	
3	Trenching/excavation	Trenching	1/14/2021	2/10/2021	5	20	
4	Building Construction	Building Construction	1/14/2021	11/17/2021	5	220	some overlap
5	Paving	Paving	11/18/2021	12/1/2021	5	10	overlap
6	Architectural Coating	Architectural Coating	12/2/2021	12/15/2021	5	10	overlap

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 11,435; Non-Residential Outdoor: 3,812; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41

Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48
Trenching/excavation	Excavators	1	8.00	158	0.38
Trenching/excavation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	125.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	2.00	1.00	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	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching/excavation	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 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	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**2.3900e-003**	**1.0500e-003**	**3.4400e-003**	**2.6000e-004**	**9.7000e-004**	**1.2300e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0816	0.0816	0.0000	0.0000	0.0816
Total	**4.0000e-005**	**3.0000e-005**	**3.1000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0816**	**0.0816**	**0.0000**	**0.0000**	**0.0816**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4000e-004	0.0000	5.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.3000e-004	0.0104	0.0205	4.0000e-005		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**6.3000e-004**	**0.0104**	**0.0205**	**4.0000e-005**	**5.4000e-004**	**6.0000e-005**	**6.0000e-004**	**6.0000e-005**	**6.0000e-005**	**1.2000e-004**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.1000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0816	0.0816	0.0000	0.0000	0.0816
Total	**4.0000e-005**	**3.0000e-005**	**3.1000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0816**	**0.0816**	**0.0000**	**0.0000**	**0.0816**

3.3 Grading - 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	tons/yr										MT/yr					

Fugitive Dust					0.0197	0.0000	0.0197	0.0101	0.0000	0.0101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4800e-003	0.0606	0.0293	6.0000e-005		2.7500e-003	2.7500e-003		2.5300e-003	2.5300e-003	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**5.4800e-003**	**0.0606**	**0.0293**	**6.0000e-005**	**0.0197**	**2.7500e-003**	**0.0225**	**0.0101**	**2.5300e-003**	**0.0126**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.7000e-004	0.0160	2.5500e-003	5.0000e-005	1.0700e-003	5.0000e-005	1.1200e-003	2.9000e-004	5.0000e-005	3.4000e-004	0.0000	4.6942	4.6942	2.0000e-004	0.0000	4.6992
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	7.7000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2039	0.2039	1.0000e-005	0.0000	0.2041
Total	**5.8000e-004**	**0.0161**	**3.3200e-003**	**5.0000e-005**	**1.3100e-003**	**5.0000e-005**	**1.3600e-003**	**3.5000e-004**	**5.0000e-005**	**4.0000e-004**	**0.0000**	**4.8981**	**4.8981**	**2.1000e-004**	**0.0000**	**4.9033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4400e-003	0.0000	4.4400e-003	2.2800e-003	0.0000	2.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1100e-003	0.0191	0.0364	6.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**1.1100e-003**	**0.0191**	**0.0364**	**6.0000e-005**	**4.4400e-003**	**1.0000e-004**	**4.5400e-003**	**2.2800e-003**	**1.0000e-004**	**2.3800e-003**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.7000e-004	0.0160	2.5500e-003	5.0000e-005	1.0700e-003	5.0000e-005	1.1200e-003	2.9000e-004	5.0000e-005	3.4000e-004	0.0000	4.6942	4.6942	2.0000e-004	0.0000	4.6992
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	7.7000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2039	0.2039	1.0000e-005	0.0000	0.2041
Total	**5.8000e-004**	**0.0161**	**3.3200e-003**	**5.0000e-005**	**1.3100e-003**	**5.0000e-005**	**1.3600e-003**	**3.5000e-004**	**5.0000e-005**	**4.0000e-004**	**0.0000**	**4.8981**	**4.8981**	**2.1000e-004**	**0.0000**	**4.9033**

3.4 Trenching/excavation - 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	tons/yr										MT/yr					
Off-Road	4.1600e-003	0.0405	0.0553	8.0000e-005		2.1600e-003	2.1600e-003		1.9900e-003	1.9900e-003	0.0000	7.2674	7.2674	2.3500e-003	0.0000	7.3262
Total	**4.1600e-003**	**0.0405**	**0.0553**	**8.0000e-005**		**2.1600e-003**	**2.1600e-003**		**1.9900e-003**	**1.9900e-003**	**0.0000**	**7.2674**	**7.2674**	**2.3500e-003**	**0.0000**	**7.3262**

Unmitigated Construction Off-Site

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

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.2900e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3399	0.3399	1.0000e-005	0.0000	0.3401
Total	**1.8000e-004**	**1.3000e-004**	**1.2900e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3399**	**0.3399**	**1.0000e-005**	**0.0000**	**0.3401**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3300e-003	0.0363	0.0626	8.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	7.2674	7.2674	2.3500e-003	0.0000	7.3261
Total	**1.3300e-003**	**0.0363**	**0.0626**	**8.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**7.2674**	**7.2674**	**2.3500e-003**	**0.0000**	**7.3261**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.2900e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3399	0.3399	1.0000e-005	0.0000	0.3401

Total	**1.8000e-004**	**1.3000e-004**	**1.2900e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3399**	**0.3399**	**1.0000e-005**	**0.0000**	**0.3401**

3.5 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	tons/yr										MT/yr					
Off-Road	0.2250	1.7630	1.6019	2.7500e-003		0.0899	0.0899		0.0861	0.0861	0.0000	228.4136	228.4136	0.0449	0.0000	229.5371
Total	**0.2250**	**1.7630**	**1.6019**	**2.7500e-003**		**0.0899**	**0.0899**		**0.0861**	**0.0861**	**0.0000**	**228.4136**	**228.4136**	**0.0449**	**0.0000**	**229.5371**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.6000e-004	0.0118	2.4300e-003	3.0000e-005	7.3000e-004	3.0000e-005	7.6000e-004	2.1000e-004	3.0000e-005	2.4000e-004	0.0000	2.9271	2.9271	1.7000e-004	0.0000	2.9315
Worker	8.1000e-004	5.6000e-004	5.6600e-003	2.0000e-005	1.7500e-003	1.0000e-005	1.7600e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4955	1.4955	4.0000e-005	0.0000	1.4964
Total	**1.1700e-003**	**0.0123**	**8.0900e-003**	**5.0000e-005**	**2.4800e-003**	**4.0000e-005**	**2.5200e-003**	**6.8000e-004**	**4.0000e-005**	**7.2000e-004**	**0.0000**	**4.4226**	**4.4226**	**2.1000e-004**	**0.0000**	**4.4279**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0505	1.2150	1.6949	2.7500e-003		0.0183	0.0183		0.0183	0.0183	0.0000	228.4133	228.4133	0.0449	0.0000	229.5368
Total	**0.0505**	**1.2150**	**1.6949**	**2.7500e-003**		**0.0183**	**0.0183**		**0.0183**	**0.0183**	**0.0000**	**228.4133**	**228.4133**	**0.0449**	**0.0000**	**229.5368**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.6000e-004	0.0118	2.4300e-003	3.0000e-005	7.3000e-004	3.0000e-005	7.6000e-004	2.1000e-004	3.0000e-005	2.4000e-004	0.0000	2.9271	2.9271	1.7000e-004	0.0000	2.9315
Worker	8.1000e-004	5.6000e-004	5.6600e-003	2.0000e-005	1.7500e-003	1.0000e-005	1.7600e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.4955	1.4955	4.0000e-005	0.0000	1.4964
Total	**1.1700e-003**	**0.0123**	**8.0900e-003**	**5.0000e-005**	**2.4800e-003**	**4.0000e-005**	**2.5200e-003**	**6.8000e-004**	**4.0000e-005**	**7.2000e-004**	**0.0000**	**4.4226**	**4.4226**	**2.1000e-004**	**0.0000**	**4.4279**

3.6 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	tons/yr										MT/yr					

Off-Road	5.3200e-003	0.0532	0.0589	9.0000e-005		2.9100e-003	2.9100e-003		2.6900e-003	2.6900e-003	0.0000	7.7524	7.7524	2.4600e-003	0.0000	7.8138
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.3200e-003**	**0.0532**	**0.0589**	**9.0000e-005**		**2.9100e-003**	**2.9100e-003**		**2.6900e-003**	**2.6900e-003**	**0.0000**	**7.7524**	**7.7524**	**2.4600e-003**	**0.0000**	**7.8138**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	1.9000e-004	1.9300e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5098	0.5098	1.0000e-005	0.0000	0.5101
Total	**2.8000e-004**	**1.9000e-004**	**1.9300e-003**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5098**	**0.5098**	**1.0000e-005**	**0.0000**	**0.5101**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4800e-003	0.0376	0.0649	9.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	7.7524	7.7524	2.4600e-003	0.0000	7.8138
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4800e-003**	**0.0376**	**0.0649**	**9.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**7.7524**	**7.7524**	**2.4600e-003**	**0.0000**	**7.8138**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	1.9000e-004	1.9300e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5098	0.5098	1.0000e-005	0.0000	0.5101
Total	**2.8000e-004**	**1.9000e-004**	**1.9300e-003**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5098**	**0.5098**	**1.0000e-005**	**0.0000**	**0.5101**

3.7 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	tons/yr										MT/yr					
Archit. Coating	0.0530					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0900e-003	7.6300e-003	9.0900e-003	1.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004	0.0000	1.2766	1.2766	9.0000e-005	0.0000	1.2788
Total	**0.0541**	**7.6300e-003**	**9.0900e-003**	**1.0000e-005**		**4.7000e-004**	**4.7000e-004**		**4.7000e-004**	**4.7000e-004**	**0.0000**	**1.2766**	**1.2766**	**9.0000e-005**	**0.0000**	**1.2788**

Unmitigated Construction Off-Site

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

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0530					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	5.3000e-003	9.1600e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	1.2766	1.2766	9.0000e-005	0.0000	1.2788
Total	**0.0533**	**5.3000e-003**	**9.1600e-003**	**1.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**1.2766**	**1.2766**	**9.0000e-005**	**0.0000**	**1.2788**

Mitigated Construction Off-Site

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

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6892	1.4170	4.3588	8.9200e-003	0.7147	9.2200e-003	0.7239	0.1911	8.5800e-003	0.1997	0.0000	812.3240	812.3240	0.0493	0.0000	813.5556
Unmitigated	0.6892	1.4170	4.3588	8.9200e-003	0.7147	9.2200e-003	0.7239	0.1911	8.5800e-003	0.1997	0.0000	812.3240	812.3240	0.0493	0.0000	813.5556

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market (24 Hour)	0.00	0.00	0.00		
Gasoline/Service Station	4,107.00	1,547.60	1263.20	1,917,945	1,917,945
Total	4,107.00	1,547.60	1,263.20	1,917,945	1,917,945

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
Convenience Market (24 Hour)	9.50	7.30	7.30	0.90	80.10	19.00	24	15	61
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	13	31	56

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market (24 Hour)	0.556917	0.035296	0.183646	0.120139	0.017882	0.004687	0.016156	0.056151	0.001190	0.001453	0.005055	0.000610	0.000818
Gasoline/Service Station	0.589830	0.037142	0.193252	0.126423	0.018817	0.004932	0.010000	0.010000	0.001252	0.001529	0.005319	0.000642	0.000861

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7.6633	7.6633	1.0600e-003	2.2000e-004	7.7550
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7.6633	7.6633	1.0600e-003	2.2000e-004	7.7550
NaturalGas Mitigated	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8055	5.8055	1.1000e-004	1.1000e-004	5.8400
NaturalGas Unmitigated	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8055	5.8055	1.1000e-004	1.1000e-004	5.8400

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market (24 Hour)	56160	3.0000e-004	2.7500e-003	2.3100e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.9969	2.9969	6.0000e-005	5.0000e-005	3.0147

Gasoline/Service Station	52630	2.8000e-004	2.5800e-003	2.1700e-003	2.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.8085	2.8085	5.0000e-005	5.0000e-005	2.8252
Total		**5.8000e-004**	**5.3300e-003**	**4.4800e-003**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**5.8055**	**5.8055**	**1.1000e-004**	**1.0000e-004**	**5.8400**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market (24 Hour)	56160	3.0000e-004	2.7500e-003	2.3100e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.9969	2.9969	6.0000e-005	5.0000e-005	3.0147
Gasoline/Service Station	52630	2.8000e-004	2.5800e-003	2.1700e-003	2.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.8085	2.8085	5.0000e-005	5.0000e-005	2.8252
Total		**5.8000e-004**	**5.3300e-003**	**4.4800e-003**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**5.8055**	**5.8055**	**1.1000e-004**	**1.0000e-004**	**5.8400**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market (24 Hour)	56592	5.3906	7.4000e-004	1.5000e-004	5.4551
Gasoline/Service Station	23858.6	2.2726	3.1000e-004	6.0000e-005	2.2998
Total		**7.6633**	**1.0500e-003**	**2.1000e-004**	**7.7550**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market (24 Hour)	56592	5.3906	7.4000e-004	1.5000e-004	5.4551
Gasoline/Service Station	23858.6	2.2726	3.1000e-004	6.0000e-005	2.2998
Total		**7.6633**	**1.0500e-003**	**2.1000e-004**	**7.7550**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0351	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.7000e-004
Unmitigated	0.0351	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.7000e-004

6.2 Area by SubCategory

Unmitigated

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

SubCategory	tons/yr										MT/yr					
Architectural Coating	5.3000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0298					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.7000e-004
Total	**0.0351**	**0.0000**	**2.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.4000e-004**	**4.4000e-004**	**0.0000**	**0.0000**	**4.7000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.3000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0298					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.7000e-004
Total	**0.0351**	**0.0000**	**2.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.4000e-004**	**4.4000e-004**	**0.0000**	**0.0000**	**4.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			

Mitigated	0.6442	0.0203	4.9000e-004	1.2980
Unmitigated	0.6442	0.0203	4.9000e-004	1.2980

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market (24 Hour)	0.355548 / 0.217917	0.3687	0.0116	2.8000e-004	0.7429
Gasoline/Service Station	0.265638 / 0.16281	0.2755	8.6800e-003	2.1000e-004	0.5551
Total		**0.6442**	**0.0203**	**4.9000e-004**	**1.2980**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market (24 Hour)	0.355548 / 0.217917	0.3687	0.0116	2.8000e-004	0.7429
Gasoline/Service Station	0.265638 / 0.16281	0.2755	8.6800e-003	2.1000e-004	0.5551
Total		**0.6442**	**0.0203**	**4.9000e-004**	**1.2980**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5.1174	0.3024	0.0000	12.6782
Unmitigated	5.1174	0.3024	0.0000	12.6782

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market (24 Hour)	14.43	2.9292	0.1731	0.0000	7.2569
Gasoline/Service Station	10.78	2.1882	0.1293	0.0000	5.4213
Total		**5.1174**	**0.3024**	**0.0000**	**12.6782**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e

Land Use	tons	MT/yr			
Convenience Market (24 Hour)	14.43	2.9292	0.1731	0.0000	7.2569
Gasoline/Service Station	10.78	2.1882	0.1293	0.0000	5.4213
Total		**5.1174**	**0.3024**	**0.0000**	**12.6782**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Rotten Robbie GDF in Manteca - San Joaquin County, Annual

Rotten Robbie GDF in Manteca

San Joaquin County, Annual

2005 BAU Emissions

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Convenience Market (24 Hour)	4.80	1000sqft	0.00	4,800.00	0
Gasoline/Service Station	20.00	Pump	2.02	2,823.50	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	51
Climate Zone	2			**Operational Year**	2005
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E default rate

Land Use - 16 gas + 4 diesel. Added land use for market

Construction Phase - default schedule without demolition. PD = 10-months

Off-road Equipment - added trenching equipment

Trips and VMT - Local traffic only

Grading - Assume some base rock imported and some trenched material exported

Vehicle Trips - Traffic predicts 4,107 daily with 56% passby and 31% diverted = 205.35/77.38/63.16

Construction Off-road Equipment Mitigation - BMPs plus Tier 4

Fleet Mix - only 2% large trucks

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaCoating	Area_EF_Residential_Exterior	250	150
tblAreaCoating	Area_EF_Residential_Interior	250	150
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblFleetMix	HHD	0.05	0.01
tblFleetMix	LDA	0.47	0.49
tblFleetMix	LDT1	0.07	0.07
tblFleetMix	LDT2	0.16	0.17
tblFleetMix	LHD1	0.04	0.04
tblFleetMix	LHD2	5.9260e-003	0.01
tblFleetMix	MCY	5.2120e-003	0.01
tblFleetMix	MDV	0.18	0.19
tblFleetMix	MH	2.0380e-003	0.00
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	8.7000e-004	0.00
tblFleetMix	SBUS	5.8400e-004	0.00
tblFleetMix	UBUS	1.9680e-003	0.00
tblLandUse	LotAcreage	0.11	0.00
tblLandUse	LotAcreage	0.06	2.02
tblVehicleTrips	DV_TP	27.00	31.00
tblVehicleTrips	PB_TP	59.00	56.00

tblVehicleTrips	PR_TP	14.00	13.00
tblVehicleTrips	ST_TR	863.10	0.00
tblVehicleTrips	ST_TR	168.56	77.38
tblVehicleTrips	SU_TR	758.45	0.00
tblVehicleTrips	SU_TR	168.56	63.16
tblVehicleTrips	WD_TR	737.99	0.00
tblVehicleTrips	WD_TR	168.56	205.35

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0351	0.0000	2.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.9000e-004
Energy	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	29.2095	29.2095	1.1700e-003	3.3000e-004	29.3357
Mobile	2.7726	4.1249	22.0526	0.0243	0.7136	0.0645	0.7781	0.1907	0.0610	0.2516	0.0000	1,044.6689	1,044.6689	0.2048	0.0000	1,049.7900
Waste						0.0000	0.0000		0.0000	0.0000	5.1174	0.0000	5.1174	0.3024	0.0000	12.6782
Water						0.0000	0.0000		0.0000	0.0000	0.1971	1.3655	1.5626	0.0203	4.9000e-004	2.2164
Total	**2.8083**	**4.1302**	**22.0574**	**0.0243**	**0.7136**	**0.0649**	**0.7785**	**0.1907**	**0.0614**	**0.2521**	**5.3145**	**1,075.2442**	**1,080.5587**	**0.5287**	**8.2000e-004**	**1,094.0206**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0351	0.0000	2.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.9000e-004
Energy	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	29.2095	29.2095	1.1700e-003	3.3000e-004	29.3357
Mobile	2.7726	4.1249	22.0526	0.0243	0.7136	0.0645	0.7781	0.1907	0.0610	0.2516	0.0000	1,044.6689	1,044.6689	0.2048	0.0000	1,049.7900
Waste						0.0000	0.0000		0.0000	0.0000	5.1174	0.0000	5.1174	0.3024	0.0000	12.6782
Water						0.0000	0.0000		0.0000	0.0000	0.1971	1.3655	1.5626	0.0203	4.9000e-004	2.2164
Total	**2.8083**	**4.1302**	**22.0574**	**0.0243**	**0.7136**	**0.0649**	**0.7785**	**0.1907**	**0.0614**	**0.2521**	**5.3145**	**1,075.2442**	**1,080.5587**	**0.5287**	**8.2000e-004**	**1,094.0206**

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.7726	4.1249	22.0526	0.0243	0.7136	0.0645	0.7781	0.1907	0.0610	0.2516	0.0000	1,044.6689	1,044.6689	0.2048	0.0000	1,049.7900
Unmitigated	2.7726	4.1249	22.0526	0.0243	0.7136	0.0645	0.7781	0.1907	0.0610	0.2516	0.0000	1,044.6689	1,044.6689	0.2048	0.0000	1,049.7900

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market (24 Hour)	0.00	0.00	0.00		
Gasoline/Service Station	4,107.00	1,547.60	1263.20	1,917,945	1,917,945
Total	4,107.00	1,547.60	1,263.20	1,917,945	1,917,945

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market (24 Hour)	9.50	7.30	7.30	0.90	80.10	19.00	24	15	61
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	13	31	56

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market (24 Hour)	0.469017	0.066969	0.162053	0.179952	0.040904	0.005926	0.016959	0.047547	0.000870	0.001968	0.005212	0.000584	0.002038
Gasoline/Service Station	0.490000	0.070000	0.170000	0.190000	0.040000	0.010000	0.010000	0.010000	0.000000	0.000000	0.010000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	23.4040	23.4040	1.0600e-003	2.2000e-004	23.4957
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	23.4040	23.4040	1.0600e-003	2.2000e-004	23.4957
NaturalGas Mitigated	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8055	5.8055	1.1000e-004	1.1000e-004	5.8400
NaturalGas Unmitigated	5.9000e-004	5.3300e-003	4.4800e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.8055	5.8055	1.1000e-004	1.1000e-004	5.8400

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market (24 Hour)	56160	3.0000e-004	2.7500e-003	2.3100e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.9969	2.9969	6.0000e-005	5.0000e-005	3.0147
Gasoline/Service Station	52630	2.8000e-004	2.5800e-003	2.1700e-003	2.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.8085	2.8085	5.0000e-005	5.0000e-005	2.8252
Total		**5.8000e-004**	**5.3300e-003**	**4.4800e-003**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**5.8055**	**5.8055**	**1.1000e-004**	**1.0000e-004**	**5.8400**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market (24 Hour)	56160	3.0000e-004	2.7500e-003	2.3100e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.9969	2.9969	6.0000e-005	5.0000e-005	3.0147
Gasoline/Service Station	52630	2.8000e-004	2.5800e-003	2.1700e-003	2.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.8085	2.8085	5.0000e-005	5.0000e-005	2.8252
Total		**5.8000e-004**	**5.3300e-003**	**4.4800e-003**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**5.8055**	**5.8055**	**1.1000e-004**	**1.0000e-004**	**5.8400**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market (24 Hour)	56592	16.4633	7.4000e-004	1.5000e-004	16.5278
Gasoline/Service Station	23858.6	6.9407	3.1000e-004	6.0000e-005	6.9679
Total		**23.4040**	**1.0500e-003**	**2.1000e-004**	**23.4957**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market (24 Hour)	56592	16.4633	7.4000e-004	1.5000e-004	16.5278
Gasoline/Service Station	23858.6	6.9407	3.1000e-004	6.0000e-005	6.9679
Total		**23.4040**	**1.0500e-003**	**2.1000e-004**	**23.4957**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0351	0.0000	2.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.9000e-004
Unmitigated	0.0351	0.0000	2.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.9000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.3000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0298					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	2.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.9000e-004
Total	**0.0351**	**0.0000**	**2.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.4000e-004**	**4.4000e-004**	**0.0000**	**0.0000**	**4.9000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.3000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0298					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Landscaping	4.0000e-005	0.0000	2.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.4000e-004	4.4000e-004	0.0000	0.0000	4.9000e-004
Total	**0.0351**	**0.0000**	**2.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.4000e-004**	**4.4000e-004**	**0.0000**	**0.0000**	**4.9000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.5626	0.0203	4.9000e-004	2.2164
Unmitigated	1.5626	0.0203	4.9000e-004	2.2164

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market (24 Hour)	0.355548 / 0.217917	0.8944	0.0116	2.8000e-004	1.2686
Gasoline/Service Station	0.265638 / 0.16281	0.6682	8.6800e-003	2.1000e-004	0.9478
Total		**1.5626**	**0.0203**	**4.9000e-004**	**2.2164**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market (24 Hour)	0.355548 / 0.217917	0.8944	0.0116	2.8000e-004	1.2686
Gasoline/Service Station	0.265638 / 0.16281	0.6682	8.6800e-003	2.1000e-004	0.9478
Total		**1.5626**	**0.0203**	**4.9000e-004**	**2.2164**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5.1174	0.3024	0.0000	12.6782
Unmitigated	5.1174	0.3024	0.0000	12.6782

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market (24 Hour)	14.43	2.9292	0.1731	0.0000	7.2569
Gasoline/Service Station	10.78	2.1882	0.1293	0.0000	5.4213
Total		**5.1174**	**0.3024**	**0.0000**	**12.6782**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market (24 Hour)	14.43	2.9292	0.1731	0.0000	7.2569
Gasoline/Service Station	10.78	2.1882	0.1293	0.0000	5.4213
Total		**5.1174**	**0.3024**	**0.0000**	**12.6782**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Rotten Robbie GDF in Manteca

San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Gasoline/Service Station	20.00	Pump	2.02	2,823.50	0
Convenience Market (24 Hour)	4.80	1000sqft	0.00	4,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	51
Climate Zone	2			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 rate

Land Use - 16 gas + 4 diesel. Added land use for market

Construction Phase - default schedule without demolition. PD = 10-months

Grading - Assume some base rock imported and some trenched material exported

Vehicle Trips - Traffic predicts 4,107 daily with 56% passby and 31% diverted = 205.35/77.38/63.16

Construction Off-road Equipment Mitigation - BMPs plus Tier 4

Off-road Equipment - added trenching equipment

Fleet Mix - only 2% large trucks

Trips and VMT - Local traffic only

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim

tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblFleetMix	HHD	0.06	0.01
tblFleetMix	LDA	0.56	0.59
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT2	0.18	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	4.6870e-003	4.9320e-003
tblFleetMix	MCY	5.0550e-003	5.3190e-003
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.1800e-004	8.6100e-004
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	1.1900e-003	1.2520e-003
tblFleetMix	SBUS	6.1000e-004	6.4200e-004
tblFleetMix	UBUS	1.4530e-003	1.5290e-003
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialImported	0.00	500.00
tblLandUse	LotAcreage	0.06	2.02
tblLandUse	LotAcreage	0.11	0.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00

tblVehicleTrips	DV_TP	27.00	31.00
tblVehicleTrips	PB_TP	59.00	56.00
tblVehicleTrips	PR_TP	14.00	13.00
tblVehicleTrips	ST_TR	863.10	0.00
tblVehicleTrips	ST_TR	168.56	77.38
tblVehicleTrips	SU_TR	758.45	0.00
tblVehicleTrips	SU_TR	168.56	63.16
tblVehicleTrips	WD_TR	737.99	0.00
tblVehicleTrips	WD_TR	168.56	205.35

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.2972	1.9670	1.7756	3.0600e-003	0.0226	0.0993	0.1218	0.0105	0.0948	0.1053	0.0000	255.6119	255.6119	0.0530	0.0000	256.9363
Maximum	**0.2972**	**1.9670**	**1.7756**	**3.0600e-003**	**0.0226**	**0.0993**	**0.1218**	**0.0105**	**0.0948**	**0.1053**	**0.0000**	**255.6119**	**255.6119**	**0.0530**	**0.0000**	**256.9363**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1092	1.3383	1.8935	3.0600e-003	5.4200e-003	0.0188	0.0242	2.4600e-003	0.0188	0.0213	0.0000	255.6116	255.6116	0.0530	0.0000	256.9360
Maximum	**0.1092**	**1.3383**	**1.8935**	**3.0600e-003**	**5.4200e-003**	**0.0188**	**0.0242**	**2.4600e-003**	**0.0188**	**0.0213**	**0.0000**	**255.6116**	**255.6116**	**0.0530**	**0.0000**	**256.9360**

	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	**63.26**	**31.96**	**-6.64**	**0.00**	**75.98**	**81.06**	**80.12**	**76.55**	**80.17**	**79.81**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2021	3-31-2021	0.6486	0.3950
2	4-1-2021	6-30-2021	0.5898	0.3764
3	7-1-2021	9-30-2021	0.5963	0.3805
		Highest	0.6486	0.3950

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	1/1/2021	1/5/2021	5	3	

2	Grading	Grading	1/6/2021	1/13/2021	5	6	
3	Building Construction	Building Construction	1/14/2021	11/17/2021	5	220	some overlap
4	Paving	Paving	11/18/2021	12/1/2021	5	10	overlap
5	Architectural Coating	Architectural Coating	12/2/2021	12/15/2021	5	10	overlap
6	Trenching/excavation	Trenching	1/14/2021	2/10/2021	5	20	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 11,435; Non-Residential Outdoor: 3,812; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Building Construction	Generator Sets	1	8.00	84	0.74
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Paving	Paving Equipment	1	8.00	132	0.36
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Site Preparation	Scrapers	1	8.00	367	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Building Construction	Welders	3	8.00	46	0.45
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48
Trenching/excavation	Excavators	1	8.00	158	0.38
Trenching/excavation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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	3	8.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	125.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	2.00	1.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Trenching/excavation	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 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	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**2.3900e-003**	**1.0500e-003**	**3.4400e-003**	**2.6000e-004**	**9.7000e-004**	**1.2300e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	9.7200e-003	9.7200e-003	0.0000	0.0000	9.7400e-003
Total	**2.0000e-005**	**1.0000e-005**	**8.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.7200e-003**	**9.7200e-003**	**0.0000**	**0.0000**	**9.7400e-003**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4000e-004	0.0000	5.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.3000e-004	0.0104	0.0205	4.0000e-005		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**6.3000e-004**	**0.0104**	**0.0205**	**4.0000e-005**	**5.4000e-004**	**6.0000e-005**	**6.0000e-004**	**6.0000e-005**	**6.0000e-005**	**1.2000e-004**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	9.7200e-003	9.7200e-003	0.0000	0.0000	9.7400e-003
Total	**2.0000e-005**	**1.0000e-005**	**8.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.7200e-003**	**9.7200e-003**	**0.0000**	**0.0000**	**9.7400e-003**

3.3 Grading - 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	tons/yr										MT/yr					
Fugitive Dust					0.0197	0.0000	0.0197	0.0101	0.0000	0.0101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4800e-003	0.0606	0.0293	6.0000e-005		2.7500e-003	2.7500e-003		2.5300e-003	2.5300e-003	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**5.4800e-003**	**0.0606**	**0.0293**	**6.0000e-005**	**0.0197**	**2.7500e-003**	**0.0225**	**0.0101**	**2.5300e-003**	**0.0126**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	6.6100e-003	7.3000e-004	1.0000e-005	5.0000e-005	1.0000e-005	6.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.9288	0.9288	1.7000e-004	0.0000	0.9330
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	2.1000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0243	0.0243	0.0000	0.0000	0.0243
Total	**1.8000e-004**	**6.6300e-003**	**9.4000e-004**	**1.0000e-005**	**7.0000e-005**	**1.0000e-005**	**8.0000e-005**	**3.0000e-005**	**1.0000e-005**	**3.0000e-005**	**0.0000**	**0.9531**	**0.9531**	**1.7000e-004**	**0.0000**	**0.9573**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4400e-003	0.0000	4.4400e-003	2.2800e-003	0.0000	2.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1100e-003	0.0191	0.0364	6.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**1.1100e-003**	**0.0191**	**0.0364**	**6.0000e-005**	**4.4400e-003**	**1.0000e-004**	**4.5400e-003**	**2.2800e-003**	**1.0000e-004**	**2.3800e-003**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	6.6100e-003	7.3000e-004	1.0000e-005	5.0000e-005	1.0000e-005	6.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.9288	0.9288	1.7000e-004	0.0000	0.9330
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	2.1000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0243	0.0243	0.0000	0.0000	0.0243
Total	**1.8000e-004**	**6.6300e-003**	**9.4000e-004**	**1.0000e-005**	**7.0000e-005**	**1.0000e-005**	**8.0000e-005**	**3.0000e-005**	**1.0000e-005**	**3.0000e-005**	**0.0000**	**0.9531**	**0.9531**	**1.7000e-004**	**0.0000**	**0.9573**

3.4 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	tons/yr										MT/yr					
Off-Road	0.2250	1.7630	1.6019	2.7500e-003		0.0899	0.0899		0.0861	0.0861	0.0000	228.4136	228.4136	0.0449	0.0000	229.5371
Total	**0.2250**	**1.7630**	**1.6019**	**2.7500e-003**		**0.0899**	**0.0899**		**0.0861**	**0.0861**	**0.0000**	**228.4136**	**228.4136**	**0.0449**	**0.0000**	**229.5371**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.6900e-003	1.5200e-003	1.0000e-005	1.0000e-004	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.9877	0.9877	1.6000e-004	0.0000	0.9917
Worker	2.9000e-004	1.2000e-004	1.5300e-003	0.0000	1.6000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1783	0.1783	1.0000e-005	0.0000	0.1785
Total	**4.8000e-004**	**7.8100e-003**	**3.0500e-003**	**1.0000e-005**	**2.6000e-004**	**1.0000e-005**	**2.8000e-004**	**7.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**1.1660**	**1.1660**	**1.7000e-004**	**0.0000**	**1.1702**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0505	1.2150	1.6949	2.7500e-003		0.0183	0.0183		0.0183	0.0183	0.0000	228.4133	228.4133	0.0449	0.0000	229.5368
Total	**0.0505**	**1.2150**	**1.6949**	**2.7500e-003**		**0.0183**	**0.0183**		**0.0183**	**0.0183**	**0.0000**	**228.4133**	**228.4133**	**0.0449**	**0.0000**	**229.5368**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.6900e-003	1.5200e-003	1.0000e-005	1.0000e-004	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.9877	0.9877	1.6000e-004	0.0000	0.9917
Worker	2.9000e-004	1.2000e-004	1.5300e-003	0.0000	1.6000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1783	0.1783	1.0000e-005	0.0000	0.1785
Total	**4.8000e-004**	**7.8100e-003**	**3.0500e-003**	**1.0000e-005**	**2.6000e-004**	**1.0000e-005**	**2.8000e-004**	**7.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**1.1660**	**1.1660**	**1.7000e-004**	**0.0000**	**1.1702**

3.5 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	tons/yr										MT/yr					
Off-Road	5.3200e-003	0.0532	0.0589	9.0000e-005		2.9100e-003	2.9100e-003		2.6900e-003	2.6900e-003	0.0000	7.7524	7.7524	2.4600e-003	0.0000	7.8138
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.3200e-003**	**0.0532**	**0.0589**	**9.0000e-005**		**2.9100e-003**	**2.9100e-003**		**2.6900e-003**	**2.6900e-003**	**0.0000**	**7.7524**	**7.7524**	**2.4600e-003**	**0.0000**	**7.8138**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	4.0000e-005	5.2000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0608	0.0608	0.0000	0.0000	0.0609
Total	**1.0000e-004**	**4.0000e-005**	**5.2000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0608**	**0.0608**	**0.0000**	**0.0000**	**0.0609**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4800e-003	0.0376	0.0649	9.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	7.7524	7.7524	2.4600e-003	0.0000	7.8138
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4800e-003**	**0.0376**	**0.0649**	**9.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**7.7524**	**7.7524**	**2.4600e-003**	**0.0000**	**7.8138**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	4.0000e-005	5.2000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0608	0.0608	0.0000	0.0000	0.0609
Total	**1.0000e-004**	**4.0000e-005**	**5.2000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0608**	**0.0608**	**0.0000**	**0.0000**	**0.0609**

3.6 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	tons/yr										MT/yr					
Archit. Coating	0.0530					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0900e-003	7.6300e-003	9.0900e-003	1.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004	0.0000	1.2766	1.2766	9.0000e-005	0.0000	1.2788
Total	**0.0541**	**7.6300e-003**	**9.0900e-003**	**1.0000e-005**		**4.7000e-004**	**4.7000e-004**		**4.7000e-004**	**4.7000e-004**	**0.0000**	**1.2766**	**1.2766**	**9.0000e-005**	**0.0000**	**1.2788**

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0530					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	5.3000e-003	9.1600e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	1.2766	1.2766	9.0000e-005	0.0000	1.2788
Total	**0.0533**	**5.3000e-003**	**9.1600e-003**	**1.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**1.2766**	**1.2766**	**9.0000e-005**	**0.0000**	**1.2788**

Mitigated Construction Off-Site

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

3.7 Trenching/excavation - 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	tons/yr										MT/yr					
Off-Road	4.1700e-003	0.0405	0.0554	8.0000e-005		2.1600e-003	2.1600e-003		1.9900e-003	1.9900e-003	0.0000	7.2790	7.2790	2.3500e-003	0.0000	7.3379
Total	**4.1700e-003**	**0.0405**	**0.0554**	**8.0000e-005**		**2.1600e-003**	**2.1600e-003**		**1.9900e-003**	**1.9900e-003**	**0.0000**	**7.2790**	**7.2790**	**2.3500e-003**	**0.0000**	**7.3379**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	3.0000e-005	3.5000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0405	0.0405	0.0000	0.0000	0.0406
Total	**7.0000e-005**	**3.0000e-005**	**3.5000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0405**	**0.0405**	**0.0000**	**0.0000**	**0.0406**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3300e-003	0.0364	0.0627	8.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	7.2790	7.2790	2.3500e-003	0.0000	7.3379
Total	**1.3300e-003**	**0.0364**	**0.0627**	**8.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**7.2790**	**7.2790**	**2.3500e-003**	**0.0000**	**7.3379**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	3.0000e-005	3.5000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0405	0.0405	0.0000	0.0000	0.0406
Total	**7.0000e-005**	**3.0000e-005**	**3.5000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0405**	**0.0405**	**0.0000**	**0.0000**	**0.0406**

Attachment 2: Health Risk Assessment

Health Risk Calculation Methodology

A health risk assessment for exposure to TACs requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and CARB develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[16] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by state law, compared to previous published risk assessment guidelines. The SJVAPCD has recently revised Risk Management Policy to incorporate OEHHA's new guidelines.[17]

This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and SJVAPCD recommended procedures for applying the OEHHA guidelines.[18] Guidance based on consultations with SJVAPCD was also incorporated into the assessment[19].

Cancer Risk

Potential increased cancer risks from inhalation of TACs are calculated based on the average annual TAC concentration, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration over a 70-year lifetime period. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location, at a workplace, or at a school.

The current OEHHA guidance used by SJVAPCD recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, for a 70-year residential exposure period they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. For workers, a 40-year

[16] OEHHA 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February 2015.

[17] San Joaquin Valley Air Pollution Control District. 2015. *APR-1906 Framework for Performing Health Risk Assessments*. June30, 2015.

[18] San Joaquin Valley Air Pollution Control District. 2015. *Final Draft Staff Report, Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document*. May 28, 2015

[19] San Joaquin Valley Air Pollution Control District. 2020. Email from Kyle Melching of the SJVAPCD and James Reyff of Illingworth & Rodkin, Inc. on February 6, 2020.

adult exposure period is assumed in calculating the 70-year lifetime cancer risk. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day) for residential exposures or L/kg per 8 hours for worker exposures. As recommended by the SJVAPCD, 95th percentile breathing rates are used for all age groups.

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 10^6

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day) or 8-hr breathing rate for worker
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized in Tables 1 and 2.

TABLE 1 - Health Risk Parameters used for Cancer Risk Calculations

	Exposure Type →	**Infant**		**Child**	**Adult**	**Worker**
Parameter	***Age Range*** →	**3rd Trimester**	**0<2**	**2 < 16**	**16 - 70**	**> 16**
Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$ (refer to Table 2)						
Daily Breathing Rate (L/kg-day)[a]		361	1,090	745	290	230[b]
Inhalation Absorption Factor		1	1	1	1	1
Averaging Time ((years)		70	70	70	70	70
Exposure Duration (years)		0.25	2	14	54	40
Exposure Frequency (days/year)		350	350	350	350	250
Age Sensitivity Factor		10	10	3	1	1
Fraction of Time at Home		1.0	1.0	1.0	1.0	-

[a] 95th percentile breathing rates for all age groups

[b] Worker 95th percentile 8-hour breathing rate.

Table 2 - Cancer Potency Factors and Reference Exposure Levels

TAC	**Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$**	**Reference Exposure Levels ($\mu g/m^3$)**	
		Acute (1-hour)	**Chronic (annual ave)**
DPM	1.10E+00	-	5
Benzene	1.00E-01	27	3
Ethylbenzene	8.70E-03	-	2,000
Formaldehyde	2.10E-02	55	9
Naphthalene	1.20E-01	-	9

1,3 Butadiene	6.00E-01	660	2
Aceltaldehyde	1.00E-02	470	140
Toluene	-	37,000	300
Xylenes	-	22,000	700

Non-Cancer Hazard Calculation

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). Non-cancer health effects can be acute due to short term TAC exposure (one hour) or chronic due to longer term TAC exposure (annual average). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the SJVAPCD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for projects involving construction or for residential projects locating near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is DPM. For other emission sources, such as gasoline stations, benzene, toluene, and xylenes (organic TACs) are of concern with respect acute and chronic non-cancer health effects.

Construction Health Risks

Rotten Robbie, Manteca, CA

DPM Emissions and Modeling Emission Rates - Without Mitigation

Construction Year	Construction Area	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2021	Project Site	0.0993	DPM	198.6	0.06046	7.618E-03	7,116	1.07E-06

Operation Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

DPM Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Construction Area	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2021	Project Site	0.0188	DPM	37.6	0.01145	1.442E-03	7,116	2.03E-07

Operation Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

Rotten Robbie - Construction DPM Modeling Information
AERMOD Risk Modeling Parameters and Maximum Concentrations
Off-Site Residential Receptors (1.5 meter receptor heights)
70-Year Residential Exposure - Infant/Child

Receptor Information

Number of Receptors	147
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby residences & workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	Rural
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Emission Period	DPM Concentration ($\mu g/m^3$)
2021	0.26106

Rotten Robbie - Maximum Construction Cancer Risk
Residential Receptors (1.5 meter receptor heights)
70-Year Residential Exposure - Infant/Child

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 70
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	745	290
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	54
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	1.00

* 95th percentile breathing rates

Construction Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information		
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	Annual DPM Conc. (ug/m3)	DPM Cancer Risk (per million)
0	2021	0.25	-0.25 - 0*	10	0.2611	3.55
1	2021	1	1	10	0.2611	42.88
2	2022	1	2	10	0.0000	0.00
4	2023	1	3	3	0.0000	0.00
5	2024	1	4	3	0.0000	0.00
6	2025	1	5	3	0.0000	0.00
7	2026	1	6	3	0.0000	0.00
8	2027	1	7	3	0.0000	0.00
9	2028	1	8	3	0.0000	0.00
10	2029	1	9	3	0.0000	0.00
11	2030	1	10	3	0.0000	0.00
12	2031	1	11	3	0.0000	0.00
13	2032	1	12	3	0.0000	0.00
14	2033	1	13	3	0.0000	0.00
15	2034	1	14	3	0.0000	0.00
16	2035	1	15	3	0.0000	0.00
17	2036	1	16	3	0.0000	0.00
18	2037	1	17	1	0.0000	0.00
19	2038	1	18	1	0.0000	0.00
20	2039	1	19	1	0.0000	0.00
21	2040	1	20	1	0.0000	0.00
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
65	2085	1	65	1	0.0000	0.00
66	2086	1	66	1	0.0000	0.00
67	2087	1	67	1	0.0000	0.00
68	2088	1	68	1	0.0000	0.00
69	2089	1	69	1	0.0000	0.00
70	2090	1	70	1	0.0000	0.00
Total Increased Cancer Risk						**46.43**

* Third trimester of pregnancy

Rotten Robbie - Maximum Construction Cancer Risk
Residential Receptors (1.5 meter receptor heights)
70-Year Residential Exposure - Adult Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 70
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	745	290
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	54
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	1.00

* 95th percentile breathing rates

Construction Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Adult Exposure Information		
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	Annual DPM Conc. (ug/m3)	DPM Cancer Risk (per million)
1	2021	1	Adult	1	0.2611	1.14
2	2022	1	Adult	1	0.0000	0.00
4	2023	1	Adult	1	0.0000	0.00
5	2024	1	Adult	1	0.0000	0.00
6	2025	1	Adult	1	0.0000	0.00
7	2026	1	Adult	1	0.0000	0.00
8	2027	1	Adult	1	0.0000	0.00
9	2028	1	Adult	1	0.0000	0.00
10	2029	1	Adult	1	0.0000	0.00
11	2030	1	Adult	1	0.0000	0.00
12	2031	1	Adult	1	0.0000	0.00
13	2032	1	Adult	1	0.0000	0.00
14	2033	1	Adult	1	0.0000	0.00
15	2034	1	Adult	1	0.0000	0.00
16	2035	1	Adult	1	0.0000	0.00
17	2036	1	Adult	1	0.0000	0.00
18	2037	1	Adult	1	0.0000	0.00
19	2038	1	Adult	1	0.0000	0.00
20	2039	1	Adult	1	0.0000	0.00
21	2040	1	Adult	1	0.0000	0.00
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
65	2085	1	Adult	1	0.0000	0.00
66	2086	1	Adult	1	0.0000	0.00
67	2087	1	Adult	1	0.0000	0.00
68	2088	1	Adult	1	0.0000	0.00
69	2089	1	Adult	1	0.0000	0.00
70	2090	1	Adult	1	0.0000	0.00
Total Increased Cancer Risk						**1.14**

Rotten Robbie - Mitigated Construction DPM Modeling Information
AERMOD Risk Modeling Parameters and Maximum Concentrations
Off-Site Residential Receptors (1.5 meter receptor heights)
70-Year Residential Exposure - Infant/Child

Receptor Information

Number of Receptors	147
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby residences & workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	Rural
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations - Mitigated

Emission Period	DPM Concentration ($\mu g/m^3$)
2021	0.04953

Rotten Robbie - Mitigated Construction DPM Modeling Information
AERMOD Risk Modeling Parameters and Maximum Concentrations
Off-Site Residential Receptors (1.5 meter receptor heights)
70-Year Residential Exposure - Adult Exposure

Receptor Information

Number of Receptors	147
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby residences & workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	Rural
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations - Mitigated

Emission Period	DPM Concentration ($\mu g/m^3$)
2021	0.04953

Rotten Robbie - Maximum Construction Cancer Risk - With Mitigation
Residential Receptors (1.5 meter receptor heights)
70-Year Residential Exposure - Infant/Child

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 70
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	745	290
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	54
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	1.00

* 95th percentile breathing rates

Construction Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information		
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	Annual DPM Conc. (ug/m3)	DPM Cancer Risk (per million)
0	2021	0.25	-0.25 - 0*	10	0.0495	0.67
1	2021	1	1	10	0.0495	8.14
2	2022	1	2	10	0.0000	0.00
4	2023	1	3	3	0.0000	0.00
5	2024	1	4	3	0.0000	0.00
6	2025	1	5	3	0.0000	0.00
7	2026	1	6	3	0.0000	0.00
8	2027	1	7	3	0.0000	0.00
9	2028	1	8	3	0.0000	0.00
10	2029	1	9	3	0.0000	0.00
11	2030	1	10	3	0.0000	0.00
12	2031	1	11	3	0.0000	0.00
13	2032	1	12	3	0.0000	0.00
14	2033	1	13	3	0.0000	0.00
15	2034	1	14	3	0.0000	0.00
16	2035	1	15	3	0.0000	0.00
17	2036	1	16	3	0.0000	0.00
18	2037	1	17	1	0.0000	0.00
19	2038	1	18	1	0.0000	0.00
20	2039	1	19	1	0.0000	0.00
21	2040	1	20	1	0.0000	0.00
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
65	2085	1	65	1	0.0000	0.00
66	2086	1	66	1	0.0000	0.00
67	2087	1	67	1	0.0000	0.00
68	2088	1	68	1	0.0000	0.00
69	2089	1	69	1	0.0000	0.00
70	2090	1	70	1	0.0000	0.00
Total Increased Cancer Risk						**8.8**

* Third trimester of pregnancy

Rotten Robbie - Maximum Construction Cancer Risk - With Mitigation
Residential Receptors (1.5 meter receptor heights)
70-Year Residential Exposure - Adult Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 70
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	745	290
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	54
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	1.00

* 95th percentile breathing rates

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Year	Exposure Duration (years)	Age	Maximum - Exposure Information: Age Sensitivity Factor	Annual DPM Conc. (ug/m3)	DPM Cancer Risk (per million)
1	2021	1	Adult	1	0.0495	0.22
2	2022	1	Adult	1	0.0000	0.00
4	2023	1	Adult	1	0.0000	0.00
5	2024	1	Adult	1	0.0000	0.00
6	2025	1	Adult	1	0.0000	0.00
7	2026	1	Adult	1	0.0000	0.00
8	2027	1	Adult	1	0.0000	0.00
9	2028	1	Adult	1	0.0000	0.00
10	2029	1	Adult	1	0.0000	0.00
11	2030	1	Adult	1	0.0000	0.00
12	2031	1	Adult	1	0.0000	0.00
13	2032	1	Adult	1	0.0000	0.00
14	2033	1	Adult	1	0.0000	0.00
15	2034	1	Adult	1	0.0000	0.00
16	2035	1	Adult	1	0.0000	0.00
17	2036	1	Adult	1	0.0000	0.00
18	2037	1	Adult	1	0.0000	0.00
19	2038	1	Adult	1	0.0000	0.00
20	2039	1	Adult	1	0.0000	0.00
21	2040	1	Adult	1	0.0000	0.00
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
.•	.•	.•	.•	.•	.•	.•
65	2085	1	Adult	1	0.0000	0.00
66	2086	1	Adult	1	0.0000	0.00
67	2087	1	Adult	1	0.0000	0.00
68	2088	1	Adult	1	0.0000	0.00
69	2089	1	Adult	1	0.0000	0.00
70	2090	1	Adult	1	0.0000	0.00
Total Increased Cancer Risk						**0.22**

Rotten Robie Manteca - Project Construction
AERMOD Risk Modeling Parameters and Maximum Concentrations
Off-Site Worker Receptors (1.5 meter receptor heights)
40-Year Worker Exposure

Receptor Information

Number of Receptors	12
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	Rural
Wind speed =	variable
Wind direction =	variable

Worker MEI Maximum Concentrations

Emission Period	DPM Concentration (µg/m3)
2021	0.2485

Rotten Robie Manteca - Project Construction - With Mitigation
AERMOD Risk Modeling Parameters and Maximum Concentrations
Off-Site Worker Receptors (1.5 meter receptor heights)
40-Year Worker Exposure

Receptor Information

Number of Receptors	12
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	Rural
Wind speed =	variable
Wind direction =	variable

Worker MEI Maximum Concentrations

Emission Period	DPM Concentration (µg/m3)
2021	0.0472

Rotten Robie Manteca - Project Construction
Maximum Worker Cancer Risk from Project Construction
at Worker MEI Location
40-Year Off-Site Worker Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x WAF x BR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
WAF = Worker Adjustment Factor (unitless)
= (24 hrs/8 hrs) x (7 days/5 days) = 4.2 for construction modeling
= 1.0 for roadway & GDF modeling (continuous emisions)
BR = 8-hour breathing rate for workers
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Worker
Age -->	16 - 70
Parameter	
ASF	1
BR* =	230
A =	1
EF =	250
ED =	40
AT =	70
WAF =	4.2

* 95th percentile worker 8-hr breathing rate

Construction Cancer Risk by Year - Maximum Risk Location*

Exposure Year	Exposure Duration (years)	Maximum - Exposure Information: Age Sensitivity Factor	Annual DPM Conc. (ug/m3)	DPM Cancer Risk (per million)
2021	1	1	0.2485	2.58
2022	1	1	0.0000	0.00
2023	1	1	0.0000	0.00
2024	1	1	0.0000	0.00
2025	1	1	0.0000	0.00
2026	1	1	0.0000	0.00
2027	1	1	0.0000	0.00
2028	1	1	0.0000	0.00
.•	.•	.•	.•	.•
.•	.•	.•	.•	.•
2050	1	1	0.0000	0.00
Total Increased Cancer Risk				**2.58**

* Maximum occurs south of project site

Rotten Robie Manteca - Project Construction - With Mitigation
Maximum Worker Cancer Risk from Project Construction
at Worker MEI Location
40-Year Off-Site Worker Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x WAF x BR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
WAF = Worker Adjustment Factor (unitless)
= (24 hrs/8 hrs) x (7 days/5 days) = 4.2 for construction modeling
= 1.0 for roadway & GDF modeling (continuous emisions)
BR = 8-hour breathing rate for workers
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Worker
Age -->	16 - 70
Parameter	
ASF	1
BR* =	230
A =	1
EF =	250
ED =	40
AT =	70
WAF =	4.2

* 95th percentile worker 8-hr breathing rate

Construction Cancer Risk by Year - Maximum Risk Location*

		Maximum - Exposure Information		
Exposure Year	Exposure Duration (years)	Age Sensitivity Factor	Annual DPM Conc. (ug/m3)	DPM Cancer Risk (per million)
2021	1	1	0.0472	0.49
2022	1	1	0.0000	0.00
2023	1	1	0.0000	0.00
2024	1	1	0.0000	0.00
2025	1	1	0.0000	0.00
2026	1	1	0.0000	0.00
2027	1	1	0.0000	0.00
2028	1	1	0.0000	0.00
.•	.•	.•	.•	.•
.•	.•	.•	.•	.•
2050	1	1	0.0000	0.00
Total Increased Cancer Risk				**0.49**

* Maximum occurs south of project site

Project Operation Emissions and Health Risks

Rotten Robbie Fuel Station - Manteca
2022 Fuel Delivery and Customer Heavy Duty Diesel Truck Emissions - DPM

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Trucks (%)	No. of Daily Trucks	Travel Speed (mph)	DPM[b] Emission Factor (g/veh-mi)	Truck Travel DPM Emissions Daily (g/day)	Hourly (g/s)	Annual (lb/year)
Fuel Delivery Trucks (HDT)														
Off-Site Travel														
Northbound Airport Way	NBFT_DPM	1377	420	12	3.66	1.70	1.83	100%	1.4	25	0.01948	0.007	8.50E-08	5.91E-03
Southbound Airport Way	SBFT_DPM	1377	420	12	3.66	1.70	1.83	100%	1.4	25	0.01948	0.007	8.50E-08	5.91E-03
On-Site Travel														
On-site Delivery Truck Route	OSFT_DPM	556	169	12	3.66	1.70	1.83	100%	1.4	5	0.04590	0.007	8.08E-08	5.62E-03
Customer Heavy Duty Trucks (HDT)														
Off-Site Travel														
Northbound Airport Way	NBCT_DPM	1377	420	12	3.66	1.70	1.83	100%	166	25	0.01948	0.845	9.78E-06	6.80E-01
Southbound Airport Way	SBCT_DPM	1377	420	12	3.66	1.70	1.83	100%	166	25	0.01948	0.845	9.78E-06	6.80E-01
On-Site Travel														
On-site Customer HD Truck Route	OSCT_DPM	496	151	12	3.66	1.70	1.83	100%	166	5	0.04590	0.717	8.30E-06	5.77E-01

[a] Line-volume source parameters from SJVAPCD *Guidance for Air Dispersion Modeling*.

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

On-Site Diesel Truck Idle Emissions

Project Phase	Stack[a] Height (m)	Stack[a] Diameter (m)	Stack[a] Velocity (m/s)	Stack[a] Temp (^{o}K)	Percent of Daily Trucks (%)	No. of Daily Trucks	Idle Emission Factor (g/veh-hr)	Idle Emissions Idle Emissions (g/day)	Hourly (g/s)	Annual (lb/year)
On-Site										
Fuel Delivery Truck Idle	3.84	0.1	51.71	366	100.0%	1.4	0.22949	0.0829	9.59E-07	6.67E-02

[a] Point source parameters from SJVAPCD *Guidance for Air Dispersion Modeling*.

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Truck Information

Total Fuel Truck Trips per day =	2.9
Total Fuel Trucks per day =	1.4
Customer Truck Trips per day =	333
Total Customer Trucks per day =	166
Operation Days =	365
Opertion Hours (hrs/day) =	24

Truck Idle DPM Emission Information (2022)

Emission Factor @ 5 mph (g/mi) =	0.04590
HHDT Idle Emission Rate (g/hr) =	0.22949
Idle Time per Truck (min)	15

Idle emission factor (g/hr) = EF @5 mph (g/mi) * 5 mph

Rotten Robbie Fuel Station - Manteca
2022 Customer Vehicle TAC Emissions - 1,3 Butadiene

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Vehicles (%)	No. of Daily Vehicles	Travel Speed (mph)	1,3 Butadiene Emission Factors[b] Evaporative (g/veh-hr)	Evaporative (g/veh-mi)	Exhaust (g/veh-mi)	Total (g/veh-mi)	Customer 1,3 Butadiene Emissions Daily (g/day)	Hourly (g/s)	Annual (lb/year)
Off-Site Travel																	
Northbound Airport Way - South	NBAS_BUTA	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00027	0.00027	0.055	6.38E-07	4.44E-02
Southbound Airport Way - South	SBAS_BUTA	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00027	0.00027	0.055	6.38E-07	4.44E-02
Northbound Airport Way - Central	NBAC_BUTA	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00027	0.00027	0.029	3.37E-07	2.34E-02
Southbound Airport Way - Central	NBAC_BUTA	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00027	0.00027	0.029	3.37E-07	2.34E-02
Northbound Airport Way - North	NBAN_BUTA	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00027	0.00027	0.071	8.18E-07	5.69E-02
Southbound Airport Way - North	SBAN_BUTA	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00027	0.00027	0.071	8.18E-07	5.69E-02
Eastbound Wawona Ave	EBW_BUTA	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00027	0.00027	0.019	2.19E-07	1.52E-02
Eastbound Wawona Ave	WBW_BUTA	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00027	0.00027	0.019	2.19E-07	1.52E-02
On-Site Travel																	
Customer Vehicles - Wawona Ave	OSW_BUTA	678	207	12	2.60	1.21	1.30	11%	226	5	0.00000	0.00000	0.00115	0.00115	0.033	3.86E-07	2.68E-02
Customer Vehicles - Airport Way	OSA_BUTA	466	142	12	2.60	1.21	1.30	89%	1,828	5	0.00000	0.00000	0.00115	0.00115	0.186	2.15E-06	1.49E-01

[a] Line-volume source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Vehicle Information

Customer Vehicle Trips per day =	4,107
Total Customer Vehicles per day =	2,054
Operation Days =	365
Opertion Hours (hrs/day) =	24

References

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 nonattainment and maintenance Areas*, November 2015

Rotten Robbie Fuel Station - Manteca
2022 Customer Vehicle TAC Emissions - Acetaldehyde

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Vehicles (%)	No. of Daily Vehicles	Travel Speed (mph)	Acetaldehyde Emission Factors[b]				Customer Acetaldehyde Emissions		
											Evaporative		Exhaust	Total	Daily	Hourly	Annual
											(g/veh-hr)	(g/veh-mi)	(g/veh-mi)	(g/veh-mi)	(g/day)	(g/s)	(lb/year)
Off-Site Travel																	
Northbound Airport Way - South	NBAS_ACET	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00045	0.00045	0.091	1.06E-06	7.35E-02
Southbound Airport Way - South	SBAS_ACET	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00045	0.00045	0.091	1.06E-06	7.35E-02
Northbound Airport Way - Central	NBAC_ACET	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00045	0.00045	0.048	5.58E-07	3.88E-02
Southbound Airport Way - Central	NBAC_ACET	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00045	0.00045	0.048	5.58E-07	3.88E-02
Northbound Airport Way - North	NBAN_ACET	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00045	0.00045	0.117	1.36E-06	9.42E-02
Southbound Airport Way - North	SBAN_ACET	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00045	0.00045	0.117	1.36E-06	9.42E-02
Eastbound Wawona Ave	EBW_ACET	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00045	0.00045	0.031	3.63E-07	2.52E-02
Eastbound Wawona Ave	WBW_ACET	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00045	0.00045	0.031	3.63E-07	2.52E-02
On-Site Travel																	
Customer Vehicles - Wawona Ave	OSW_ACET	678	207	12	2.60	1.21	1.30	11%	226	5	0.00000	0.00000	0.00231	0.00231	0.067	7.76E-07	5.40E-02
Customer Vehicles - Airport Way	OSA_ACET	466	142	12	2.60	1.21	1.30	89%	1,828	5	0.00000	0.00000	0.00231	0.00231	0.373	4.32E-06	3.00E-01

[a] Line-volume source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Vehicle Information

Customer Vehicle Trips per day =	4,107
Total Customer Vehicles per day =	2,054
Operation Days =	365
Opertion Hours (hrs/day) =	24

References

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 nonattainment and maintenance Areas* , November 2015

Rotten Robbie Fuel Station - Manteca
2022 Customer Vehicle TAC Emissions - Benzene

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Vehicles (%)	No. of Daily Vehicles	Travel Speed (mph)	Benzene Emission Factors[b]				Customer Benzene Emissions		
											Evaporative		Exhaust	Total	Daily	Hourly	Annual
											(g/veh-hr)	(g/veh-mi)	(g/veh-mi)	(g/veh-mi)	(g/day)	(g/s)	(lb/year)
Off-Site Travel																	
Northbound Airport Way - South	NBAS_BENZ	1377	420	12	2.60	1.21	1.30	38%	780	25	0.01747	0.00070	0.00123	0.00193	0.392	4.54E-06	3.16E-01
Southbound Airport Way - South	SBAS_BENZ	1377	420	12	2.60	1.21	1.30	38%	780	25	0.01747	0.00070	0.00123	0.00193	0.392	4.54E-06	3.16E-01
Northbound Airport Way - Central	NBAC_BENZ	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.01747	0.00070	0.00123	0.00193	0.207	2.39E-06	1.66E-01
Southbound Airport Way - Central	SBAC_BENZ	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.01747	0.00070	0.00123	0.00193	0.207	2.39E-06	1.66E-01
Northbound Airport Way - North	NBAN_BENZ	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.01747	0.00070	0.00123	0.00193	0.503	5.82E-06	4.05E-01
Southbound Airport Way - North	SBAN_BENZ	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.01747	0.00070	0.00123	0.00193	0.503	5.82E-06	4.05E-01
Eastbound Wawona Ave	EBW_BENZ	1631	497	12	2.60	1.21	1.30	11%	226	25	0.01747	0.00070	0.00123	0.00193	0.135	1.56E-06	1.08E-01
Eastbound Wawona Ave	WBW_BENZ	1631	497	12	2.60	1.21	1.30	11%	226	25	0.01747	0.00070	0.00123	0.00193	0.135	1.56E-06	1.08E-01
On-Site Travel																	
Customer Vehicles - Wawona Ave	OSW_BENZ	678	207	12	2.60	1.21	1.30	11%	226	5	0.01747	0.00349	0.00528	0.00878	0.255	2.95E-06	2.05E-01
Customer Vehicles - Airport Way	OSA_BENZ	466	142	12	2.60	1.21	1.30	89%	1,828	5	0.01747	0.00349	0.00528	0.00878	1.417	1.64E-05	1.14E+00

[a] Line-volume source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Vehicle Information

Customer Vehicle Trips per day =	4,107
Total Customer Vehicles per day =	2,054
Operation Days =	365
Opertion Hours (hrs/day) =	24

References

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 nonattainment and maintenance Areas* , November 2015

Rotten Robbie Fuel Station - Manteca
2022 Customer Vehicle TAC Emissions - DPM

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Vehicles (%)	No. of Daily Vehicles	Travel Speed (mph)	DPM Emission Factors[b]				Customer DPM Emissions		
											Evaporative		Exhaust	Total	Daily	Hourly	Annual
											(g/veh-hr)	(g/veh-mi)	(g/veh-mi)	(g/veh-mi)	(g/day)	(g/s)	(lb/year)
Off-Site Travel																	
Northbound Airport Way - South	NBAS_DPM	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00071	0.00071	0.145	1.68E-06	1.17E-01
Southbound Airport Way - South	SBAS_DPM	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00071	0.00071	0.145	1.68E-06	1.17E-01
Northbound Airport Way - Central	NBAC_DPM	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00071	0.00071	0.077	8.85E-07	6.16E-02
Southbound Airport Way - Central	SBAC_DPM	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00071	0.00071	0.077	8.85E-07	6.16E-02
Northbound Airport Way - North	NBAN_DPM	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00071	0.00071	0.186	2.15E-06	1.50E-01
Southbound Airport Way - North	SBAN_DPM	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00071	0.00071	0.186	2.15E-06	1.50E-01
Eastbound Wawona Ave	EBW_DPM	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00071	0.00071	0.050	5.76E-07	4.00E-02
Eastbound Wawona Ave	WBW_DPM	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00071	0.00071	0.050	5.76E-07	4.00E-02
On-Site Travel																	
Customer Vehicles - Wawona Ave	OSW_DPM	678	207	12	2.60	1.21	1.30	11%	226	5	0.00000	0.00000	0.00198	0.00198	0.057	6.65E-07	4.62E-02
Customer Vehicles - Airport Way	OSA_DPM	466	142	12	2.60	1.21	1.30	89%	1,828	5	0.00000	0.00000	0.00198	0.00198	0.320	3.70E-06	2.57E-01

[a] Line-volume source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Vehicle Information

Customer Vehicle Trips per day =	4,107
Total Customer Vehicles per day =	2,054
Operation Days =	365
Opertion Hours (hrs/day) =	24

References

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 nonattainment and maintenance Areas* , November 2015

Rotten Robbie Fuel Station - Manteca
2022 Customer Vehicle TAC Emissions - Ethylbenzene

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Vehicles (%)	No. of Daily Vehicles	Travel Speed (mph)	Ethylbenzene Emission Factors[b] Evaporative (g/veh-hr)	Evaporative (g/veh-mi)	Exhaust (g/veh-mi)	Total (g/veh-mi)	Customer Ethyl Benzene Emissions Daily (g/day)	Hourly (g/s)	Annual (lb/year)
Off-Site Travel																	
Northbound Airport Way - South	NBAS_ETHB	1377	420	12	2.60	1.21	1.30	38%	780	25	0.02865	0.00115	0.00052	0.00166	0.338	3.92E-06	2.72E-01
Southbound Airport Way - South	SBAS_ETHB	1377	420	12	2.60	1.21	1.30	38%	780	25	0.02865	0.00115	0.00052	0.00166	0.338	3.92E-06	2.72E-01
Northbound Airport Way - Central	NBAC_ETHB	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.02865	0.00115	0.00052	0.00166	0.178	2.06E-06	1.43E-01
Southbound Airport Way - Central	NBAC_ETHB	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.02865	0.00115	0.00052	0.00166	0.178	2.06E-06	1.43E-01
Northbound Airport Way - North	NBAN_ETHB	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.02865	0.00115	0.00052	0.00166	0.433	5.02E-06	3.49E-01
Southbound Airport Way - North	SBAN_ETHB	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.02865	0.00115	0.00052	0.00166	0.433	5.02E-06	3.49E-01
Eastbound Wawona Ave	EBW_ETHB	1631	497	12	2.60	1.21	1.30	11%	226	25	0.02865	0.00115	0.00052	0.00166	0.116	1.34E-06	9.33E-02
Eastbound Wawona Ave	WBW_ETHB	1631	497	12	2.60	1.21	1.30	11%	226	25	0.02865	0.00115	0.00052	0.00166	0.116	1.34E-06	9.33E-02
On-Site Travel																	
Customer Vehicles - Wawona Ave	OSW_ETHB	678	207	12	2.60	1.21	1.30	11%	226	5	0.02865	0.00573	0.00218	0.00791	0.230	2.66E-06	1.85E-01
Customer Vehicles - Airport Way	OSA_ETHB	466	142	12	2.60	1.21	1.30	89%	1,828	5	0.02865	0.00573	0.00218	0.00791	1.278	1.48E-05	1.03E+00

[a] Line-volume source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Vehicle Information

Customer Vehicle Trips per day =	4,107
Total Customer Vehicles per day =	2,054
Operation Days =	365
Opertion Hours (hrs/day) =	24

References

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 nonattainment and maintenance Areas* , November 2015

Rotten Robbie Fuel Station - Manteca
2022 Customer Vehicle TAC Emissions - Formaldehyde

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Vehicles (%)	No. of Daily Vehicles	Travel Speed (mph)	Formaldehyde Emission Factors[b] Evaporative (g/veh-hr)	Evaporative (g/veh-mi)	Exhaust (g/veh-mi)	Total (g/veh-mi)	Customer Formaldehyde Emissions Daily (g/day)	Hourly (g/s)	Annual (lb/year)
Off-Site Travel																	
Northbound Airport Way - South	NBAS_FORM	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00134	0.00134	0.272	3.15E-06	2.19E-01
Southbound Airport Way - South	SBAS_FORM	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00134	0.00134	0.272	3.15E-06	2.19E-01
Northbound Airport Way - Central	NBAC_FORM	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00134	0.00134	0.144	1.66E-06	1.16E-01
Southbound Airport Way - Central	NBAC_FORM	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00134	0.00134	0.144	1.66E-06	1.16E-01
Northbound Airport Way - North	NBAN_FORM	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00134	0.00134	0.349	4.04E-06	2.81E-01
Southbound Airport Way - North	SBAN_FORM	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00134	0.00134	0.349	4.04E-06	2.81E-01
Eastbound Wawona Ave	EBW_FORM	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00134	0.00134	0.093	1.08E-06	7.51E-02
Eastbound Wawona Ave	WBW_FORM	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00134	0.00134	0.093	1.08E-06	7.51E-02
On-Site Travel																	
Customer Vehicles - Wawona Ave	OSW_FORM	678	207	12	2.60	1.21	1.30	11%	226	5	0.00000	0.00000	0.00648	0.00648	0.188	2.18E-06	1.51E-01
Customer Vehicles - Airport Way	OSA_FORM	466	142	12	2.60	1.21	1.30	89%	1,828	5	0.00000	0.00000	0.00648	0.00648	1.046	1.21E-05	8.42E-01

[a] Line-volume source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Vehicle Information

Customer Vehicle Trips per day =	4,107
Total Customer Vehicles per day =	2,054
Operation Days =	365
Opertion Hours (hrs/day) =	24

References

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 nonattainment and maintenance Areas* , November 2015

Rotten Robbie Fuel Station - Manteca
2022 Customer Vehicle TAC Emissions - Naphthalene

Road Segment	Road Segment ID	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Plume[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Vehicles (%)	No. of Daily Vehicles	Travel Speed (mph)	Formaldehyde Emission Factors[b] Evaporative (g/veh-hr)	Evaporative (g/veh-mi)	Exhaust (g/veh-mi)	Total (g/veh-mi)	Customer Naphthalene Emissions Daily (g/day)	Hourly (g/s)	Annual (lb/year)
Off-Site Travel																	
Northbound Airport Way - South	NBAS_NAPH	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00003	0.00003	0.007	7.78E-08	5.41E-03
Southbound Airport Way - South	SBAS_NAPH	1377	420	12	2.60	1.21	1.30	38%	780	25	0.00000	0.00000	0.00003	0.00003	0.007	7.78E-08	5.41E-03
Northbound Airport Way - Central	NBAC_NAPH	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00003	0.00003	0.004	4.10E-08	2.85E-03
Southbound Airport Way - Central	NBAC_NAPH	310	94	12	2.60	1.21	1.30	89%	1,828	25	0.00000	0.00000	0.00003	0.00003	0.004	4.10E-08	2.85E-03
Northbound Airport Way - North	NBAN_NAPH	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00003	0.00003	0.009	9.96E-08	6.93E-03
Southbound Airport Way - North	SBAN_NAPH	1315	401	12	2.60	1.21	1.30	51%	1,047	25	0.00000	0.00000	0.00003	0.00003	0.009	9.96E-08	6.93E-03
Eastbound Wawona Ave	EBW_NAPH	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00003	0.00003	0.002	2.67E-08	1.85E-03
Eastbound Wawona Ave	WBW_NAPH	1631	497	12	2.60	1.21	1.30	11%	226	25	0.00000	0.00000	0.00003	0.00003	0.002	2.67E-08	1.85E-03
On-Site Travel																	
Customer Vehicles - Wawona Ave	OSW_NAPH	678	207	12	3.66	1.70	1.83	11%	226	5	0.00000	0.00000	0.00014	0.00014	0.004	4.77E-08	3.32E-03
Customer Vehicles - Airport Way	OSA_NAPH	466	142	12	3.66	1.70	1.83	89%	1,828	5	0.00000	0.00000	0.00014	0.00014	0.023	2.65E-07	1.84E-02

[a] Line-volume source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC for running exhaust PM10 emissions in 2022

Vehicle Information

Customer Vehicle Trips per day =	4,107
Total Customer Vehicles per day =	2,054
Operation Days =	365
Opertion Hours (hrs/day) =	24

References

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 nonattainment and maintenance Areas* , November 2015

Name	Gasoline Dispensing Operations VOC Calculator		
Applicability	Use this spreadsheet to calculate VOC emissions from gasoline dispensing operations. Entries required in yellow areas, output in grey areas.		
Author or updater	Matthew Cegielski	*Last Update*	May 1, 2018
Facility: **ID#:** **Project #:**	Rotten Robbie Gas Fueling Station 1014 S. Airport Road, Manteca		

Inputs	gal/day	gal/yr	**Formula**
	13,000	4,745,000	
	1,000 gal /hr	1,000 gal /yr	
Gasoline Throughput	5.42E-01	4.75E+03	Enter the **change** in gas station throughput in units of gallons/day and gallons/yr. Select the Phase I and Phase II type using the drop down provided. VOC emissions are calculated by the multiplication of Throughput Rates and Emission Factors.
Application Type	Type #		
EVR Phase I and EVR Phase II Installed Underground Tank	9		

Substances	**lb VOC/ 1,000 gal**	**LB/HR**	**LB/YR**
Vapor Tank Filling Loss VOC	0.08	4.55E-02	3.99E+02
Vehicle Refueling VOC	0.42	2.28E-01	1.99E+03
Breathing Loss VOC	0.03	1.35E-02	1.19E+02
Spillage VOC	0.42	2.28E-01	1.99E+03
Total VOC	0.95	5.14E-01	4.50E+03

References:

* The emission factors are derived from Appendix A in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Asessment Guidelines*.

	1	2	3	4	5	6	7	8	9	10	11	12
	Phase 1 and Phase II Exempt Aboveground tank	Non-EVR Phase I and Phase II Exempt Aboveground tank	EVR Phase I and Phase II Exempt Aboveground tank	Non-EVR Phase I and Non-EVR Phase II Installed Aboveground tank	EVR Phase I and Non-EVR Phase II Installed (or Phase II Exempt Due to ORVR) Aboveground tank	EVR Phase I and EVR Phase II (VR-501 only) Installed Aboveground tank	**Phase I and Phase II Exempt Underground Tank**	**EVR Phase I and Phase II Exempt Underground Tank**	**EVR Phase I and EVR Phase II Installed Underground Tank**	**EVR Phase I and Non-EVR Phase II Installed (or Phase II Exempt Due to ORVR/E85) Underground Tank**	**Non-EVR Phase I and Phase II Exempt Underground Tank**	**Non-EVR Phase I and Non-EVR Phase II Installed Underground Tank**
Process	lb VOC/1,000 gal											
Tank Filling Loss	8.4	0.42	0.17	0.42	0.17	0.17	8.4	0.084	0.084	0.084	0.42	0.42
Vehicle Refueling	8.4	8.4	8.4	0.42	0.42	0.38	8.4	8.4	0.42	0.42	8.4	0.42
Breathing Loss	2.1	0.053	0.053	0.053	0.053	0.053	0.84	0.025	0.025	0.025	0.025	0.025
Vapor VOC EF	18.90	8.87	8.62	0.89	0.64	0.60	17.64	8.51	0.53	0.53	8.85	0.87
Spillage	0.61	0.42	0.42	0.42	0.42	0.42	0.61	0.61	0.42	0.42	0.61	0.42
Total VOC	19.51	9.29	9.04	1.31	1.06	1.02	18.25	9.12	0.95	0.95	9.46	1.29

Name	**Gasoline Dispensing Operations VOC from Vapor Tank Filling Loss**						
Applicability	Use this spreadsheet for vapor VOC emissions from Vapor Tank Filling Loss. Entries required in yellow areas, output in grey areas.						
Author or updater	Matthew Cegielski		*Last Update*	December 8, 2016			
Facility:	Rotten Robbie Gas Fueling Station						
ID#:	1014 S. Airport Road, Manteca						
Project #:							

Inputs	lb /hr	lb /yr	**Formula**
VOC Rate	4.55E-02	3.99E+02	Emissions are calculated by the multiplication of VOC Rates and Emission Factors.

Substances	**CAS#**	**lbs/ lb VOC**	**LB/HR**	**LB/YR**
Benzene	**71432**	3.00E-03	1.37E-04	1.20E+00
Ethyl Benzene	**100414**	1.60E-02	7.28E-04	6.38E+00
Toluene	**108883**	8.00E-02	3.64E-03	3.19E+01
Xylenes	**1330207**	2.40E-02	1.09E-03	9.57E+00

References:

* The emission factors are derived from the table, "Content of Reformulated Gasoline", in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Asessment Guidelines*.

Name	Gasoline Dispensing Operations VOC from Vapor Breathing Loss						
Applicability	Use this spreadsheet for vapor VOC emissions from Vapor Breathing Loss. Entries required in yellow areas, output in grey areas.						
Author or updater	Matthew Cegielski		*Last Update*	December 8, 2016			
Facility:	Rotten Robbie Gas Fueling Station						
ID#:	1014 S. Airport Road, Manteca						
Project #:							
Inputs	lb /hr	lb /yr	**Formula**				
VOC Rate	1.35E-02	1.19E+02	Emissions are calculated by the multiplication of VOC Rates and Emission Factors.				
Substances	**CAS#**	**lbs/ lb VOC**	**LB/HR**	**LB/YR**			
Benzene	**71432**	3.00E-03	4.06E-05	3.56E-01			
Ethyl Benzene	**100414**	1.60E-02	2.17E-04	1.90E+00			
Toluene	**108883**	8.00E-02	1.08E-03	9.49E+00			
Xylenes	**1330207**	2.40E-02	3.25E-04	2.85E+00			
References:							
* The emission factors are derived from the table, "Content of Reformulated Gasoline", in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Asessment Guidelines*.							

Name	Gasoline Dispensing Operations VOC from Vapor Vehicle Refueling						
Applicability	Use this spreadsheet for vapor VOC emissions from Vapor Vehicle Refueling. Entries required in yellow areas, output in grey areas.						
Author or updater	Matthew Cegielski		*Last Update*	December 8, 2016			
Facility:	Rotten Robbie Gas Fueling Station						
ID#:	1014 S. Airport Road, Manteca						
Project #:							
Inputs	lb /hr	lb /yr	**Formula**				
VOC Rate	2.28E-01	1.99E+03	Emissions are calculated by the multiplication of VOC Rates and Emission Factors.				
Substances	**CAS#**	**lbs/ lb VOC**	**LB/HR**	**LB/YR**			
Benzene	**71432**	3.00E-03	6.83E-04	5.98E+00			
Ethyl Benzene	**100414**	1.60E-02	3.64E-03	3.19E+01			
Toluene	**108883**	8.00E-02	1.82E-02	1.59E+02			
Xylenes	**1330207**	2.40E-02	5.46E-03	4.78E+01			
References:							
* The emission factors are derived from the table, "Content of Reformulated Gasoline", in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Asessment Guidelines*.							

Name	Gasoline Dispensing Operations VOC from Liquid						
Applicability	Use this spreadsheet for liquid VOC emissions from gasoline dispensing operations' spillage processes. Entries required in yellow areas, output in grey areas.						
Author or updater	Matthew Cegielski		*Last Update*	December 8, 2016			
Facility:	Rotten Robbie Gas Fueling Station						
ID#:	1014 S. Airport Road, Manteca						
Project #:							
Inputs	lb /hr	lb/yr	**Formula**				
VOC Rate	2.28E-01	1.99E+03	Emissions are calculated by the multiplication of VOC Rates and Emission Factors.				
Substances	**CAS#**	**lbs/ liquid vapor**	**LB/HR**	**LB/YR**			
Benzene	**71432**	1.00E-02	2.28E-03	1.99E+01			
Ethyl Benzene	**100414**	1.60E-02	3.64E-03	3.19E+01			
Toluene	**108883**	8.00E-02	1.82E-02	1.59E+02			
Xylenes	**1330207**	2.40E-02	5.46E-03	4.78E+01			
References:							
* The emission factors are derived from the table, "Content of Reformulated Gasoline", in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Asessment Guidelines*.							

Total

Substances	CAS#	LB/HR	LB/YR
Benzene	**71432**	3.13E-03	2.75E+01
Ethyl Benzene	**100414**	8.22E-03	7.20E+01
Toluene	**108883**	4.11E-02	3.60E+02
Xylenes	**1330207**	1.23E-02	1.08E+02

Gasoline Dispensing Operation Inputs	**Vehicle Spillage**	**Vehicle Refueling and hose permeation**	**Breathing loss**	**Loading loss**
SOURCE ID:	**1. SPILL**	**2. REFUEL**	**3. BREATHE**	**4. LOAD**
EMISSION FACTOR:	Rotten Robbie VOC Liquid Speciation	Rotten Robbie VOC Vapor	Rotten Robbie VOC Vapor	Rotten Robbie VOC Vapor
SOURCE TYPE:	VOLUME	VOLUME	POINT	POINT
RELEASE HEIGHT:	0 M	1 M	3.66 M	3.66 M
EMISSION RATE:	1 G/S	1 G/S	1 G/S	1 G/S
LENGTH OF SIDE:	6.5 M	6.5 M	—	—
INITIAL LATERAL DIMENSION:	1.51 M	1.51 M	—	—
INITIAL VERTICAL DIMENSION:	1.86 M	1.86 M	—	—
GAS EXIT TEMPERATURE:	—	—	288.7 1 K	291K
STACK INSIDE DIAMETER:	—	—	0.0508 M	.0508 M
GAS EXIT VELOCITY:	—	—	.000106 M/S	0.00035 M/S
GAS EXIT FLOW RATE:	—	—	.0005 CFM	0.0015 CFM

Rotten Robie Manteca. - Project Operation
AERMOD Risk Modeling Parameters, Maximum TAC Concentrations & Non-Cancer Health Effects
Off-Site Residential & Worker Receptors - 1.5 meter Receptor Heights

Receptor Information

Number of Receptors 147
Receptor Height = 1.5 meters
Receptor distances = variable - at nearby residences & workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data 2013-2017
Land Use Classification rural
Wind speed = variable
Wind direction = variable

Residential MEI Concentrations

	TAC Concentration ($\mu g/m^3$)	
	2021	2022
TAC	Max Period Average	Max Period Average
DPM	0.00000	0.00256
Benzene	0.00000	0.06582
Ethylbenzene	0.00000	0.17607
Formaldehyde	0.00000	0.00260
Naphthalene	0.00000	0.00006
1,3 Butadiene	0.00000	0.00048
Aceltaldehyde	0.00000	0.00091

2021 - Maximum Non-Cancer Health Effects

	Maximum Concentration		Hazard Index	
	Period Ave	1-Hour		
TAC	($\mu g/m^3$)	($\mu g/m^3$)	Chronic	Acute
DPM	0.261060	-	5.22E-02	-
Benzene	-	-	-	-
Ethylbenzene	-	-	-	-
Formaldehyde	-	-	-	-
Naphthalene	-	-	-	-
1,3 Butadiene	-	-	-	-
Aceltaldehyde	-	-	-	-
Toluene	-	-	-	-
Xylenes	-	-	-	-
Total			**0.05**	**0.000**

* Maximum for all receptors (residential and worker)

2022 - Non-Cancer Health Effects

	Maximum Concentration		Hazard Index	
	Period Ave	1-Hour		
TAC	($\mu g/m^3$)	($\mu g/m^3$)	Chronic	Acute
DPM	0.00595	-	1.19E-03	-
Benzene	0.07178	2.84961	2.39E-02	1.06E-01
Ethylbenzene	0.17693	-	8.85E-05	-
Formaldehyde	0.00394	0.0680798	4.38E-04	1.24E-03
Naphthalene	0.00009	-	9.91E-06	-
1,3 Butadiene	0.00073	0.0122963	3.63E-04	1.86E-05
Aceltaldehyde	0.00138	0.0241349	9.89E-06	5.14E-05
Toluene	0.86643	33.113	2.89E-03	8.95E-04
Xylenes	0.25978	9.92838	3.71E-04	4.51E-04
Total			**0.029**	**0.108**

* Maximum for all receptors (residential and worker)

Rotten Robie Manteca - Project Operation
Maximum Residential Cancer Risk from Project Operation
at Residential MEI Location
70-Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 to 2**	**2 to 16**	**17 - 70**
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	745	290
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	54
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	1.00

* 95th percentile breathing rates

Cancer Potency Factors and Reference Exposure Levels (REL)

		REL ($\mu g/m^3$)	
TAC	**CPF $(mg/kg\text{-}day)^{-1}$**	**Acute (1-hour)**	**Chronic (ann ave)**
DPM	1.10E+00	-	5
Benzene	1.00E-01	27	3
Ethylbenzene	8.70E-03	-	2,000
Formaldehyde	2.10E-02	55	9
Naphthalene	1.20E-01	-	9
1,3 Butadiene	6.00E-01	660	2
Aceltaldehyde	1.00E-02	470	140
Toluene	-	37,000	300
Xylenes	-	22,000	700

Project Construction & Operation Cancer Risk - Maximum Impact at Residential Receptor Location

				Maximum - Exposure Information							Cancer Risk (per million)							
				Annual Conc (ug/m3)														
Exposure Year Age	**Initial Exposure Year**	**Exposure Duration (years)**	**Age Sensitivity Factor**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**Total**
0	2022	0.25	10	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.0348	0.0814	0.0189	0.0007	0.0001	0.0000	0.0000	0.14
0 - 1	2022	1	10	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.4200	0.9827	0.228721	0.0081	0.0010	0.0427	0.0014	1.68
1 < 2	2022	1	10	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.4200	0.9827	0.228721	0.0081	0.0010	0.0427	0.0014	1.68
2 < 16	2022	14	3	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	1.2056	2.8211	0.65658	0.0234	0.0030	0.1226	0.0039	4.84
16 - 70	2022	54	1	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.6034	1.4119	0.32860	0.0117	0.0015	0.0613	0.0020	2.42
Total Increased Cancer Risk											**2.7**	**6.3**	**1.5**	**0.1**	**0.0**	**0.3**	**0.0**	**10.8**

* Third trimester of pregnancy

Rotten Robie Manteca. - Project Operation
AERMOD Risk Modeling Parameters, Maximum TAC Concentrations
Off-Site Worker Receptors - 1.5 meter Receptor Heights

Receptor Information

Number of Receptors	12
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	rural
Wind speed =	variable
Wind direction =	variable

Risk Worker MEI Concentrations

	TAC Concentration ($\mu g/m^3$)	
	2021	2022
TAC	Max Period Average	Max Period Average
DPM	0.24852	0.00576
Benzene	0.00000	0.07178
Ethylbenzene	0.00000	0.17693
Formaldehyde	0.00000	0.00394
Naphthalene	0.00000	0.00009
1,3 Butadiene	0.00000	0.00073
Aceltaldehyde	0.00000	0.00138

Rotten Robie Manteca - Project Operation
Maximum Worker Cancer Risk from Project Operation
at Worker MEI Location
40-Year Off-Site Worker Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x WAF x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)

WAF = Worker Adjustment Factor (unitless)
= (24 hrs/8 hrs) x (7 days/5 days) = 4.2 for construction modeling
= 1.0 for roadway & GDF modeling (continuous emisions)

DBR = daily breathing rate (L/kg body weight-day) for residential & 8-hour breathing rate for workers
A = Inhalation absorption factor

EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult	Worker
Age -->	**3rd Trimester**	**0 to 2**	**2 to 16**	**17 - 70**	**17 - 70**
Parameter					
ASF	10	10	3	1	1
DBR* =	361	1090	745	290	230
WAF** =	-	-	-	-	4.2
A =	1	1	1	1	1
EF =	350	350	350	350	250
ED =	0.25	2	14	54	40
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	-

* 95th percentile breathing rates, worker breathing rate is an 8-hour rate (L/kg per 8 hours)
** Worker adjustment factor only applied for worker exposures.

Cancer Potency Factors and Reference Exposure Levels (REL)

		REL ($\mu g/m^3$)	
TAC	**CPF $(mg/kg\text{-}day)^{-1}$**	**Acute (1-hour)**	**Chronic (ann ave)**
DPM	1.10E+00	-	5
Benzene	1.00E-01	27	3
Ethylbenzene	8.70E-03	-	2,000
Formaldehyde	2.10E-02	55	9
Naphthalene	1.20E-01	-	9
1,3 Butadiene	6.00E-01	660	2
Aceltaldehyde	1.00E-02	470	140
Toluene	-	37,000	300
Xylenes	-	22,000	700

Project Construction & Operation Cancer Risk - Maximum Impact at Worker Receptor Location

				Maximum - Exposure Information							Cancer Risk (per million)							
				Annual Conc (ug/m3)														
Exposure Year Age Range	**Initial Exposure Year**	**Exposure Duration (years)**	**Age Sensitivity Factor**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**Total**
16	2022	1	1	0.00576	0.07178	0.17693	0.003939	0.00009	0.000726	0.00138	0.0599	0.0678	0.01455	0.0008	0.0001	0.0041	0.0001	0.15
17 - 70	2022	39	1	0.00576	0.07178	0.17693	0.003939	0.00009	0.000726	0.00138	0.5558	0.6300	0.13510	0.0073	0.0009	0.0382	0.0012	1.37
Total Increased Cancer Risk											**0.6**	**0.7**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**1.52**

Combined Project Construction and Operation Health Risks

Rotten Robie Manteca. - Project Construction & Operation
AERMOD Risk Modeling Parameters, Maximum TAC Concentrations & Non-Cancer Health Effects
Off-Site Residential & Worker Receptors - 1.5 meter Receptor Heights

Receptor Information

Number of Receptors 147
Receptor Height = 1.5 meters
Receptor distances = variable - at nearby residences & workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data 2013-2017
Land Use Classification rural
Wind speed = variable
Wind direction = variable

Construction-Cancer Risk MEI Concentrations

TAC	TAC Concentration (µg/m^3) 2021 Max Period Average	2022 Max Period Average
DPM	0.26106	0.00256
Benzene	0.00000	0.06582
Ethylbenzene	0.00000	0.17607
Formaldehyde	0.00000	0.00260
Naphthalene	0.00000	0.00006
1,3 Butadiene	0.00000	0.00048
Aceltaldehyde	0.00000	0.00091

2021 - Maximum Non-Cancer Health Effects

TAC	Maximum Concentration Period Ave (µg/m^3)	Maximum Concentration 1-Hour (µg/m^3)	Hazard Index Chronic	Hazard Index Acute
DPM	0.261060	-	5.22E-02	-
Benzene	-	-	-	-
Ethylbenzene	-	-	-	-
Formaldehyde	-	-	-	-
Naphthalene	-	-	-	-
1,3 Butadiene	-	-	-	-
Aceltaldehyde	-	-	-	-
Toluene	-	-	-	-
Xylenes	-	-	-	-
Total			**0.0522**	**0.000**

2022 - Non-Cancer Health Effects

TAC	Maximum Concentration Period Ave (µg/m^3)	Maximum Concentration 1-Hour (µg/m^3)	Hazard Index Chronic	Hazard Index Acute
DPM	0.00595	-	1.19E-03	-
Benzene	0.07178	2.84961	2.39E-02	1.06E-01
Ethylbenzene	0.17693	-	8.85E-05	-
Formaldehyde	0.00394	0.0680798	4.38E-04	1.24E-03
Naphthalene	0.00009	-	9.91E-06	-
1,3 Butadiene	0.00073	0.0122963	3.63E-04	1.86E-05
Aceltaldehyde	0.00138	0.0241349	9.89E-06	5.14E-05
Toluene	0.86643	33.113	2.89E-03	8.95E-04
Xylenes	0.25978	9.92838	3.71E-04	4.51E-04
Total			**0.0293**	**0.108**

Rotten Robie Manteca - Project Construction & Operation
Maximum Residential Cancer Risk from Project Construction & Operation
at Residential MEI Location
70-Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 to 2**	**2 to 16**	**17 - 70**
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	745	290
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	54
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	1.00

* 95th percentile breathing rates

Cancer Potency Factors and Reference Exposure Levels (REL)

		REL ($\mu g/m^3$)	
TAC	**CPF $(mg/kg\text{-}day)^{-1}$**	**Acute (1-hour)**	**Chronic (ann ave)**
DPM	1.10E+00	-	5
Benzene	1.00E-01	27	3
Ethylbenzene	8.70E-03	-	2,000
Formaldehyde	2.10E-02	55	9
Naphthalene	1.20E-01	-	9
1,3 Butadiene	6.00E-01	660	2
Aceltaldehyde	1.00E-02	470	140
Toluene	-	37,000	300
Xylenes	-	22,000	700

Project Operation Cancer Risk - Maximum Project Operation Impact Receptor Location

				Maximum - Exposure Information														
				Annual Conc (ug/m3)							Cancer Risk (per million)							
Exposure Year Age	**Initial Exposure Year**	**Exposure Duration (years)**	**Age Sensitivity Factor**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**Total**
0	2021	0.25	10	0.26106	0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	3.5502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.55
0 - 1	2021	1	10	0.26106	0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	42.8782	0.0000	0.000000	0.0000	0.0000	0.0000	0.0000	42.88
1 - 2	2022	1	10	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.4200	0.9827	0.228721	0.0081	0.0010	0.0427	0.0014	1.68
2 - 16	2022	14	3	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	1.2056	2.8211	0.65658	0.0234	0.0030	0.1226	0.0039	4.84
17 - 70	2022	54	1	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.6034	1.4119	0.32860	0.0117	0.0015	0.0613	0.0020	2.42
Total Increased Cancer Risk											**48.7**	**5.2**	**1.2**	**0.0**	**0.0**	**0.2**	**0.0**	**55.4**

* Third trimester of pregnancy

Rotten Robie Manteca. - Project Construction & Operation
AERMOD Risk Modeling Parameters, Maximum TAC Concentrations & Non-Cancer Health Effects
Off-Site Residential & Worker Receptors - 1.5 meter Receptor Heights
With Construction Mitigation Applied

Receptor Information

Number of Receptors 147
Receptor Height = 1.5 meters
Receptor distances = variable - at nearby residences & workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data 2013-2017
Land Use Classification rural
Wind speed = variable
Wind direction = variable

Construction-Cancer Risk MEI Concentrations

TAC	TAC Concentration (µg/m^3) 2021 Max Period Average	2022 Max Period Average
DPM	0.04953	0.00256
Benzene	0.00000	0.06582
Ethylbenzene	0.00000	0.17607
Formaldehyde	0.00000	0.00260
Naphthalene	0.00000	0.00006
1,3 Butadiene	0.00000	0.00048
Aceltaldehyde	0.00000	0.00091

2021 - Maximum Non-Cancer Health Effects

TAC	Maximum Concentration Period Ave (µg/m^3)	1-Hour (µg/m^3)	Hazard Index Chronic	Acute
DPM	0.049530	-	9.91E-03	-
Benzene	-	-	-	-
Ethylbenzene	-	-	-	-
Formaldehyde	-	-	-	-
Naphthalene	-	-	-	-
1,3 Butadiene	-	-	-	-
Aceltaldehyde	-	-	-	-
Toluene	-	-	-	-
Xylenes	-	-	-	-
Total			**0.01**	**-**

2022 - Non-Cancer Health Effects

TAC	Maximum Concentration Period Ave (µg/m^3)	1-Hour (µg/m^3)	Hazard Index Chronic	Acute
DPM	0.00595	-	1.19E-03	-
Benzene	0.07178	2.84961	2.39E-02	1.06E-01
Ethylbenzene	0.17693	-	8.85E-05	-
Formaldehyde	0.00394	0.0680798	4.38E-04	1.24E-03
Naphthalene	0.00009	-	9.91E-06	-
1,3 Butadiene	0.00073	0.0122963	3.63E-04	1.86E-05
Aceltaldehyde	0.00138	0.0241349	9.89E-06	5.14E-05
Toluene	0.86643	33.113	2.89E-03	8.95E-04
Xylenes	0.25978	9.92838	3.71E-04	4.51E-04
Total			**0.03**	**0.11**

Rotten Robie Manteca - Project Construction & Operation
Maximum Residential Cancer Risk from Project Construction & Operation
With Construction Mitigation Applied
at Residential MEI Location - 70-Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 to 2**	**2 to 16**	**17 - 70**
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	745	290
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	54
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	1.00

* 95th percentile breathing rates

Cancer Potency Factors and Reference Exposure Levels (REL)

		REL ($\mu g/m^3$)	
TAC	**CPF $(mg/kg\text{-}day)^{-1}$**	**Acute (1-hour)**	**Chronic (ann ave)**
DPM	1.10E+00	-	5
Benzene	1.00E-01	27	3
Ethylbenzene	8.70E-03	-	2,000
Formaldehyde	2.10E-02	55	9
Naphthalene	1.20E-01	-	9
1,3 Butadiene	6.00E-01	660	2
Aceltaldehyde	1.00E-02	470	140
Toluene	-	37,000	300
Xylenes	-	22,000	700

Project Operation Cancer Risk - Maximum Project Operation Impact Receptor Location

				Maximum - Exposure Information							Cancer Risk (per million)							
				Annual Conc (ug/m3)														
Exposure Year Age	**Initial Exposure Year**	**Exposure Duration (years)**	**Age Sensitivity Factor**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**Total**
0	2021	0.25	10	0.04953	0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	0.6736	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.67
0 - 1	2021	1	10	0.04953	0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	8.1351	0.0000	0.000000	0.0000	0.0000	0.0000	0.0000	8.14
1 - 2	2022	1	10	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.4200	0.9827	0.228721	0.0081	0.0010	0.0427	0.0014	1.68
2 - 16	2022	14	3	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	1.2056	2.8211	0.65658	0.0234	0.0030	0.1226	0.0039	4.84
17 - 70	2022	54	1	0.00256	0.06582	0.17607	0.002599	0.00006	0.000477	0.00091	0.6034	1.4119	0.32860	0.0117	0.0015	0.0613	0.0020	2.42
Total Increased Cancer Risk											**11.0**	**5.2**	**1.2**	**0.0**	**0.0**	**0.2**	**0.0**	**17.7**

* Third trimester of pregnancy

Rotten Robie Manteca. - Project Construction & Operation
AERMOD Risk Modeling Parameters, Maximum TAC Concentrations
Off-Site Worker Receptors - 1.5 meter Receptor Heights

Receptor Information

Number of Receptors	12
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	rural
Wind speed =	variable
Wind direction =	variable

Risk Worker MEI Concentrations

	TAC Concentration ($\mu g/m^3$)	
	2021	2022
TAC	Max Period Average	Max Period Average
DPM	0.24852	0.00576
Benzene	0.00000	0.07178
Ethylbenzene	0.00000	0.17693
Formaldehyde	0.00000	0.00394
Naphthalene	0.00000	0.00009
1,3 Butadiene	0.00000	0.00073
Aceltaldehyde	0.00000	0.00138

Rotten Robie Manteca - Project Construction & Operation
Maximum Worker Cancer Risk from Project Construction & Operation
at Worker MEI Location
40-Year Off-Site Worker Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x WAF x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)

WAF = Worker Adjustment Factor (unitless)
= (24 hrs/8 hrs) x (7 days/5 days) = 4.2 for construction modeling
= 1.0 for roadway & GDF modeling (continuous emisions)

DBR = daily breathing rate (L/kg body weight-day) for residential & 8-hour breathing rate for workers
A = Inhalation absorption factor

EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult	Worker
Age -->	**3rd Trimester**	**0 to 2**	**2 to 16**	**17 - 70**	**17 - 70**
Parameter					
ASF	10	10	3	1	1
DBR* =	361	1090	745	290	230
WAF** =	-	-	-	-	4.2
A =	1	1	1	1	1
EF =	350	350	350	350	250
ED =	0.25	2	14	54	40
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	-

* 95th percentile breathing rates, worker breathing rate is an 8-hour rate (L/kg per 8 hours)
** Worker adjustment factor only applied for worker exposures.

Cancer Potency Factors and Reference Exposure Levels (REL)

		REL ($\mu g/m^3$)	
TAC	**CPF $(mg/kg\text{-}day)^{-1}$**	**Acute (1-hour)**	**Chronic (ann ave)**
DPM	1.10E+00	-	5
Benzene	1.00E-01	27	3
Ethylbenzene	8.70E-03	-	2,000
Formaldehyde	2.10E-02	55	9
Naphthalene	1.20E-01	-	9
1,3 Butadiene	6.00E-01	660	2
Aceltaldehyde	1.00E-02	470	140
Toluene	-	37,000	300
Xylenes	-	22,000	700

Project Construction & Operation Cancer Risk - Maximum Impact at Worker Receptor Location

				Maximum - Exposure Information							Cancer Risk (per million)							
				Annual Conc (ug/m3)														
Exposure Year Age Range	**Initial Exposure Year**	**Exposure Duration (years)**	**Age Sensitivity Factor**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**Total**
16	2021	1	1	0.24852	0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	2.5839	0.0000	0.00000	0.0000	0.0000	0.0000	0.0000	2.58
17 - 70	2022	39	1	0.00576	0.07178	0.17693	0.003939	0.00009	0.000726	0.00138	0.5558	0.6300	0.13510	0.0073	0.0009	0.0382	0.0012	1.37
Total Increased Cancer Risk											**3.1**	**0.6**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**3.95**

Rotten Robie Manteca. - Project Construction & Operation
AERMOD Risk Modeling Parameters, Maximum TAC Concentrations
Off-Site Worker Receptors - 1.5 meter Receptor Heights
With Construction Mitigation Applied

Receptor Information

Number of Receptors	12
Receptor Height =	1.5 meters
Receptor distances =	variable - at nearby workplaces

Meteorological Conditions

SJVAPCD Stockton Arpt Data	2013-2017
Land Use Classification	rural
Wind speed =	variable
Wind direction =	variable

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	TAC Concentration ($\mu g/m^3$)	
	2021	2022
TAC	Max Period Average	Max Period Average
DPM	0.04715	0.00576
Benzene	0.00000	0.07178
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Rotten Robie Manteca - Project Construction & Operation
Maximum Worker Cancer Risk from Project Construction & Operation
With Construction Mitigation Applied
at Worker MEI Location - 40-Year Off-Site Worker Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

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Values

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Parameter					
ASF	10	10	3	1	1
DBR* =	361	1090	745	290	230
WAF** =	-	-	-	-	4.2
A =	1	1	1	1	1
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ED =	0.25	2	14	54	40
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	-

* 95th percentile breathing rates, worker breathing rate is an 8-hour rate (L/kg per 8 hours)
** Worker adjustment factor only applied for worker exposures.

Cancer Potency Factors and Reference Exposure Levels (REL)

		REL $(\mu g/m^3)$	
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Ethylbenzene	8.70E-03	-	2,000
Formaldehyde	2.10E-02	55	9
Naphthalene	1.20E-01	-	9
1,3 Butadiene	6.00E-01	660	2
Aceltaldehyde	1.00E-02	470	140
Toluene	-	37,000	300
Xylenes	-	22,000	700

Project Construction & Operation Cancer Risk - Maximum Impact at Worker Receptor Location

				Maximum - Exposure Information							Cancer Risk (per million)							
				Annual Conc (ug/m3)														
Exposure Year Age Range	**Initial Exposure Year**	**Exposure Duration (years)**	**Age Sensitivity Factor**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**DPM**	**Benzene**	**Ethyl-benzene**	**Form-aldehyde**	**Naph-thalene**	**1,3 Buta-diene**	**Acetal-dehyde**	**Total**
16	2021	1	1	0.04715	0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	0.4902	0.0000	0.00000	0.0000	0.0000	0.0000	0.0000	0.49
17 - 70	2022	39	1	0.00576	0.07178	0.17693	0.003939	0.00009	0.000726	0.00138	0.5558	0.6300	0.13510	0.0073	0.0009	0.0382	0.0012	1.37
Total Increased Cancer Risk											**1.0**	**0.6**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**1.86**