EAST WHISMAN SPECIFIC PLAN AND EIR - AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

Mountain View, California

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INTRODUCTION

This report examines air quality and greenhouse gas (GHG) emissions in the Planning Area and region, includes a summary of applicable air quality and GHG regulations, and analyzes potential air quality and GHG impacts associated with the proposed East Whisman Precise Plan (EWPP) in Mountain View. The EWPP would potentially increase the office floor area ratio (FAR) within project boundaries, potentially expansion of commercial/retail opportunities, and potential locations for residential uses. The site is currently developed with light industrial and office uses, with surface parking lots adjacent to each property. This report includes a summary of applicable air quality and GHG regulations and analyzes potential air quality impacts and GHG emissions associated with the proposed EWPP.

Project Description

The 368-acre East Whisman Precise Plan or EWPP area is bounded by the U.S. 101 freeway and NASA Ames/Moffett Field to the north, Sunnyvale city limits to the east, Central Expressway and South Whisman and Whisman Station Precise Plan areas to the south, and Whisman Road to the west. The East Whisman Precise Plan area is located in the easternmost area of Mountain View and is made up of 110 parcels. The plan boundary also includes the retail area and gas station at the intersection of North Whisman and East Middlefield Roads.

The entire EEWPP area is designated *High-Intensity Office* in the 2030 General Plan. This land use designation allows office intensities from 0.35 up to a 1.0 floor area ratio (FAR), if measures for highly sustainable development are utilized. Most of the area is currently zoned *ML: Limited Industrial*, or *ML-T: Limited Industrial.* These zoning districts allow FARs of 0.35 and 0.50, respectively, for office and light-industrial uses. Two areas are zoned *P: Planned Community* following recent office redevelopment projects that requested FARs between 0.5 and 1.0, consistent with the 2030 General Plan. Much of the existing development in the area consists of older one- to two-story office and light industrial buildings with surface parking, with newer office developments up to eight stories in height with parking structures.

The EWPP would provide zoning and design standards for future development within the East Whisman Change Area, as identified in the Mountain View 2030 General Plan. The proposed East Whisman Precise Plan would include up to 2.3 million square feet of net new office uses, 100,000 square feet of retail uses, 200 hotel rooms, and 5,000 multi-family residential units (with goal of making 20 percent of the total residential units affordable). The Precise Plan also includes enhanced parks and trail corridors, new public streets, and new recreation facilities.

SETTING

Air Pollutants

Ozone

Ozone (O_3) is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X). The main sources of ROG and NO_X, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, shortness of breath, and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. While CO transport is limited, it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, hospital patients, etc.). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a reddish-brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contribute to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns (PM_{10}). $PM_{2.5}$ refers to fine suspended particulate matter with an aerodynamic diameter of 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion, through abrasion, such as tire or brake lining wear, or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces and can enter the human body through the lungs.

Lead

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufactures.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. EPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Toxic Air Contaminants (TACs)

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the EPA and the California Air Resources Board (CARB). Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation, and monitoring of TACs is relatively recent compared to that for criteria pollutants.

High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, or schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

Sensitive Receptors

Some groups of people are more affected by air pollution than others. The State has identified the following categories of people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

Regional Air Quality

The EWPP area is in the San Francisco Bay Area Air Basin. The Air Basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest portion of Solano County.

The EWPP area is within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants, and the number of days during which the region exceeds air quality standards, have fallen dramatically. Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Local Climate and Air Quality

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment.

Climate and Meteorology

During the summer, mostly clear skies result in warm daytime temperatures and cool nights in the Santa Clara Valley. Winter temperatures are mild, except for very cool but generally frost-less mornings. Further inland where the moderating effect of the bay is not as strong, temperature extremes are greater. Wind patterns are influenced by local terrain, with a northwesterly sea breeze typically developing during the daytime. Winds are usually stronger in the spring and summer. Rainfall amounts are modest, ranging from 13 inches in the lowlands to 20 inches in the hills.

Air Pollution Potential

Ozone and fine particle pollution, or $PM_{2.5}$, are the major regional air pollutants of concern in the San Francisco Bay Area. Ozone is primarily a problem in the summer, and fine particle pollution in the winter. Most of Santa Clara County is well south of the cooler waters of the San Francisco Bay and far from the cooler marine air which usually reaches across San Mateo County in summer. Ozone frequently forms on hot summer days when the prevailing seasonal northerly winds carry ozone precursors southward across the county, causing health standards to be exceeded. Santa Clara County experiences many exceedances of the $PM_{2.5}$ standard each winter. This is due to the high population density, wood smoke, industrial and freeway traffic, and poor wintertime air circulation caused by extensive hills to the east and west that block wind flow into the region.

Greenhouse Gases

Global temperatures are affected by naturally occurring and anthropogenic-generated (generated by humankind) atmospheric gases, such as water vapor, carbon dioxide, methane, and nitrous oxide. Gases that trap heat in the atmosphere are called greenhouse gases (GHG). Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. Greenhouse gases, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth's surface. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This is known as the greenhouse effect. The greenhouse effect helps maintain a habitable climate. Emissions of GHGs from human activities, such as electricity production, motor vehicle use, and agriculture, are elevating the concentration of GHGs in the atmosphere, and are reported to have led to a trend of unnatural warming of the earth's natural climate, known as global warming or global climate change. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred because it implies that there are other consequences to the global climate in addition to rising temperatures. Other than water vapor, the primary GHGs contributing to global climate change include the following gases:

- Carbon dioxide (CO_2), primarily a byproduct of fuel combustion;
- Nitrous oxide (N_2O), a byproduct of fuel combustion; also associated with agricultural operations such as the fertilization of crops;
- Methane (CH_4), commonly created by off-gassing from agricultural practices (e.g. livestock), wastewater treatment and landfill operations;
- Chlorofluorocarbons (CFCs) were used as refrigerants, propellants and cleaning solvents, but their production has been mostly prohibited by international treaty;
- Hydrofluorocarbons (HFCs) are now widely used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- Perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) emissions are commonly created by industries such as aluminum production and semiconductor manufacturing.

These gases vary considerably in terms of Global Warming Potential (GWP), a term developed to compare the propensity of each GHG to trap heat in the atmosphere relative to another GHG. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time of gas remains in the atmosphere. The GWP of each GHG is measured relative to CO_2. Accordingly, GHG emissions are typically measured and reported in terms of equivalent CO_2 (CO_2e). For instance, SF_6 is 22,800 times more intense in terms of global climate change contribution than CO_2.

An expanding body of scientific research supports the theory that global warming 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 could be adversely affected by the global warming trend. Increased precipitation and sea level rise could 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; and increased levels of air pollution.

The U.S. EPA reports that annual global GHG emissions in 2014 were on the order of 10,000 million metric tons CO2e (MMT CO2e)[1]. The U.S. was the 2nd largest emitter, accounting for 15 percent of the global emissions, while China accounted for 30 percent of the emissions. In 2016, U.S. EPA reported 6,511 MMT CO2e (or 5,795 MMT after accounting for sequestration from the land sector). U.S. emissions had decreased by an estimates 2.5 percent from the previous year and were about 12 percent lower than 2005 levels. The CARB reports that in 2016, California emitted 429 MMT CO2e. This was 12 MMT CO2e lower than 2015 emissions. The City of Mountain View reported 2015 community GHG emissions of 768,365 metric tons CO2e or 0.7 MMT CO2e. Most of the City's GHG emissions were associated with transportation (about 60 percent), followed by energy usage (33 percent).

REGULATORY FRAMEWORK

Pursuant to the federal Clean Air Act (CAA) of 1970, the U.S. Environmental Protection Agency (EPA) established national ambient air quality standards (NAAQS). The NAAQS were established for major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the Federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Both the EPA and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are designed to protect the health and welfare of the public with a reasonable margin of safety. These ambient air quality standards are levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each criteria pollutant.

Health effects of criteria pollutants and their potential sources are described below and summarized in Table 1.

[1] U.S. EPA: see https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data, accessed December 10, 2018. And Boden, T.A., Marland, G., and Andres, R.J. (2017). Global, Regional, and National Fossil-Fuel CO2Emissions. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A. doi 10.3334/CDIAC/00001_V2017

TABLE 1 Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood functions and nerve construction. • Behavioral and hearing problems in children.
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.
Toxic Air Contaminants	• Cars and trucks, especially diesels. • Industrial sources such as chrome platers. • Neighborhood businesses such as dry cleaners and service stations. • Building materials and product.	• Cancer. • Chronic eye, lung, or skin irritation. • Neurological and reproductive disorders.

Source: CARB, 2008.

Federal Air Quality Regulations

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required EPA to establish primary and secondary NAAQS and required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). Federal standards include both primary and secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.[2] The Federal Clean Air Act Amendments of 1990 (FCAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformity with the mandates of the FCAAA and determine if implementation will achieve air quality goals. If the EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area which imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in the application of sanctions on transportation funding and stationary air pollution sources in the air basin.

The 1970 FCAA authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The FCAA Amendments of 1990 changed deadlines for attaining NAAQS as well as the remedial actions required of areas of the nation that exceed the standards. Under the FCAA, State and local agencies in areas that exceed the NAAQS are required to develop SIPs to show how they will achieve the NAAQS by specific dates. The FCAA requires that projects receiving federal funds demonstrate conformity to the approved SIP and local air quality attainment plan for the region. Conformity with the SIP requirements would satisfy the FCAA requirements.

State Air Quality Regulations

The CARB is the agency responsible for the coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires that all air districts in the State achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date.

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[2] U.S. Environmental Protection Agency, 2013. Website: www.epa.gov/air/criteria.html. February.

The CCAA specifies that districts should focus on reducing the emissions from transportation and air-wide emission sources, and provides districts with the authority to regulate indirect sources.

CARB is also responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. CARB is primarily responsible for statewide pollution sources and produces a major part of the SIP. Local air districts provide additional strategies for sources under their jurisdiction. CARB combines this data and submits the completed SIP to the EPA.
Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which in many cases are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

<u>Attainment Status Designations</u>

The CARB is required to designate areas of the State as attainment, nonattainment, or unclassified for all State standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data does not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

Table 2 shows the State and Federal standards for criteria pollutants and provides a summary of the attainment status for the San Francisco Bay Area with respect to National and State ambient air quality standards.

<u>California Clean Air Act</u>

In 1988, the CCAA required that all air districts in the State endeavor to achieve and maintain CAAQS for carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) by the earliest practical date. The CCAA provides districts with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

TABLE 2 San Francisco Bay Area Attainment Status

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Mean	0.030 ppm (57 mg/m^3)	Attainment	0.053 ppm (100 µg/m^3)	Attainment
	1-Hour	0.18 ppm (338 µg/m^3)	Attainment	0.100 ppm	Unclassified
Ozone (O_3)	8-Hour	0.07 ppm (137 µg/m^3)	Nonattainment	0.070 ppm	Nonattainment
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	Not Applicable	Not Applicable
Respirable Particulate Matter (PM_{10})	Annual Mean	20 µg/m^3	Nonattainment	Not Applicable	Not Applicable
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	12 µg/m^3	Nonattainment	12 µg/m^3	Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m^3	Nonattainment
Sulfur Dioxide (SO_2)	Annual Mean	Not Applicable	Not Applicable	80 µg/m^3 (0.03 ppm)	Attainment
	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	365 µg/m^3 (0.14 ppm)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	Attainment

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.
ppm = parts per million, mg/m^3 = milligrams per cubic meter, µg/m^3 = micrograms per cubic meter
Source: Bay Area Air Quality Management District, 2016.

California Air Resources Board Handbook

In 1998, CARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[3] CARB subsequently developed an Air Quality and Land Use Handbook[4] (Handbook) in 2005 that is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. The CARB Handbook recommends that planning agencies consider

[3] California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.
[4] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

proximity to air pollution sources when considering new locations for "sensitive" land uses, such as residences, medical facilities, daycare centers, schools, and playgrounds.

Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the Handbook relative to the Plan Area include taking steps to consider or avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day or rural roads with 50,000 vehicles/day.
- Within 300 feet of gasoline fueling stations.
- Within 300 feet of dry cleaning operations (note that dry cleaning with TACs is being phased out and will be prohibited in 2023).

Bay Area Air Quality Management District (BAAQMD)

The BAAQMD seeks to attain and maintain air quality conditions in the San Francisco Bay Area Air Basin (SFBAAB) through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. The clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law.

<u>Clean Air Plan</u>

The BAAQMD is responsible for developing a Clean Air Plan which guides the region's air quality planning efforts to attain the CAAQS. The BAAQMD's 2017 Clean Air Plan is the latest Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_X), particulate matter and greenhouse gas emissions. The Bay Area 2017 Clean Air Plan, which was adopted on April 19, 2017, by the BAAQMD's board of directors:

- Updates the Bay Area 2010 Clean Air Plan in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;
- Provides a control strategy to reduce ozone, particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan;
- Reviews progress in improving air quality in recent years; and
- Continues and updates emission control measures.

BAAQMD CARE Program

The Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources, area sources and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area. The BAAQMD has identified six communities as impacted: Concord, Richmond/San Pablo, Western Alameda County, San Jose, Redwood City/East Palo Alto, and Eastern San Francisco.

Planning Healthy Places

BAAQMD developed a guidebook that provides air quality and public health information intended to assist local governments in addressing potential air quality issues related to exposure of sensitive receptors to exposure of emissions from local sources of air pollutants. The guidance provides tools and recommended best practices that can be implemented to reduce exposures. The information is provided as recommendations to develop policies and implementing measures in city or county General Plans, neighborhood or specific plans, land use development ordinances, or into projects.

Odors

Odor impacts are subjective in nature and are generally regarded as an annoyance rather than a health hazard. The ability to detect and react to odors varies considerably among people. A strong or unfamiliar odor is more easily detected and are more likely to cause complaints. BAAQMD responds to odor complaints from the public and considers a source to have a substantial number of odor complaints if the complaint history includes five or more confirmed complaints per year averaged over a 3-year period. Facilities that are regulated by CalRecycle (e.g. landfill, composting, etc.) are required to have Odor Impact Minimization Plans in place.

BAAQMD California Environmental Quality Act (CEQA) Air Quality Guidelines

The BAAQMD *CEQA Air Quality Guidelines*[5] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for air toxics, odors, and greenhouse gas emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of their *CEQA Guidelines*. In May 2011, the updated BAAQMD *CEQA Air Quality Guidelines* were amended to include a risk and hazards threshold for new receptors and modify procedures for assessing impacts related to risk and hazard impacts.

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in *California Building Industry Association (CBIA) v. BAAQMD* (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, the California Supreme Court accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument considered was whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). On December 17, 2015, the California Supreme Court ruled that CEQA generally does not require an analysis of the effects of existing environmental conditions (e.g., air quality) on a project unless the project would exacerbate those conditions somehow through its construction and/or operation. In response to the legal issues, BAAQMD revised its CEQA Guidelines in May 2017.

Local Plans and Policies

Mountain View 2030 General Plan

The Mountain View 2015-2030 General Plan includes goals to improve air quality in the region and reduce GHG emissions. To achieve these goals, the General Plan contains the following policies:

[5] Bay Area Air Quality Management District, 2011. *CEQA Air Quality Guidelines*. May.

Climate Change

INC 12.1: Emissions reduction target. Maintain a greenhouse gas emissions reduction target.

INC 12.2: Emissions reduction strategies. Develop cost-effective strategies for reducing greenhouse gas emissions.

INC 12.3: Adaptation strategies. Develop strategies for adapting to climate change in partnership with local and regional agencies.

Air Quality

INC 20.1: Pollution prevention. Discourage mobile and stationary sources of air pollution.

INC 20.2: Collaboration. Participate in state and regional planning efforts to improve air quality.

INC 20.6: Air quality standards. Protect the public and construction workers from construction exhaust and particulate emissions.

INC 20.7: Protect sensitive receptors. Protect the public from substantial pollutant concentrations.

INC 20.8: Offensive odors. Protect residents from offensive odors.

Greenhouse Gas Regulatory Framework

This section summarizes key federal, State, and City statutes, regulations, and policies that would apply to the EWPP. Global climate change resulting from GHG emissions is an emerging environmental concern being raised and discussed at the international, national, statewide and local levels. At each level, agencies are considering strategies to control emissions of gases that contribute to global climate change.

Federal Regulations

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, Congress never ratified the protocol. The federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. At this time, there are no federal regulations or policies pertaining to GHG emissions from proposed projects or plans.

State Regulations

The State of California is concerned about GHG emissions and their effect on global climate change. The State recognizes that “there appears to be a close relationship between the concentration of GHGs in the atmosphere and global temperatures" and that "the evidence for climate change is overwhelming." The effects of climate change on California, in terms of how it would affect the ecosystem and economy, remain uncertain. The State has many areas of concern regarding climate change with respect to global warming. According to the 2006 Climate Action Team Report, the following climate change effects and conditions can be expected in California over the course of the next century:

- A diminishing Sierra snowpack declining by 70 percent to 90 percent, effecting the state's water supply;
- Increasing temperatures from 8 to 10.4 degrees Fahrenheit (°F) under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution standards are exceeded in most urban areas;
- Coastal erosion along the length of California and seawater intrusion into the Sacramento River Delta from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions;
- Increased vulnerability of forests due to pest infestation and increased temperatures;
- Increased challenges for the state's important agricultural industry from water shortages, increasing temperatures, and saltwater intrusion into the Delta; and
- Increased electricity demand, particularly in the hot summer months.

Assembly Bill 1575 (1975)

In 1975, the Legislature created the California Energy Commission (CEC). The CEC regulates electricity production that is one of the major sources of GHGs.

Title 24, Part 6 of the California Code of Regulations (1978)

The Energy Efficiency Standards for Residential and Nonresidential Buildings were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.

Assembly Bill 1493 (2002)

Assembly Bill (AB) 1493 required CARB to develop and adopt regulations that reduce GHG emitted by passenger vehicles and light duty trucks.

State of California Executive Order S-3-05 (2005)

The Governor's Executive Order established aggressive emissions reductions goals: by 2010, GHG emissions must be reduced to 2000 levels; by 2020, GHG emissions must be reduced to 1990 levels; and by 2050, GHG emissions must be reduced to 80 percent below 1990 levels.

In June 2005, the Governor of California signed Executive Order S-3-05, which identified Cal/EPA as the lead coordinating State agency for establishing climate change emission reduction targets in California. A "Climate Action Team," a multi-agency group of State agencies, was set up to implement Executive Order S-3-05. Under this order, the State plans to reduce GHG emissions to 80 percent below 1990 levels by 2050. GHG emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006.

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, 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.

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.

Executive Order S-13-08 (2008)

This Executive Order directed California agencies to assess and reduce the vulnerability of future construction projects to impacts associated with sea-level rise.

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 this 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.

The new Scoping Plan establishes a path 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 (note that new building code requirements will reduce energy use by 50% in new homes)
- 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 by half;
- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;

- Reduce freight-related emissions by transitioning to zero emission facilities where feasible and near-zero emissions with renewable fuels everywhere else (e.g., hybrid and zero-emission trucks); 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 CO2e per capita by 2030 and no more than 2 metric tons CO2e 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.

Bay Area Air Quality Management District

BAAQMD is the regional government agency that regulates sources of air pollution within the nine San Francisco Bay Area counties. The BAAQMD regulates GHG emissions through the following plans, programs, and guidelines.

Regional Clean Air Plans

BAAQMD and other air districts prepare clean air plans in accordance with the State and Federal Clean Air Acts. The Bay Area 2010 Clean Air Plan (CAP) is a comprehensive plan to improve Bay Area air quality and protect public health through implementation of a control strategy designed to reduce emissions and ambient concentrations of harmful pollutants. The most recent CAP also includes measures designed to reduce GHG emissions.

BAAQMD Climate Protection Program

The BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing emissions of GHG and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

BAAQMD CEQA Air Quality Guidelines

The BAAQMD adopted revised CEQA Air Quality Guidelines on June 2, 2010 and then adopted a modified version of the Guidelines in May, 2011. The BAAQMD CEQA Air Quality Guidelines include thresholds of significance for greenhouse gas emissions. Under the latest CEQA Air

Quality Guidelines, a local government may prepare a qualified Greenhouse Gas Reduction Strategy that is consistent with AB 32 goals. If a project is consistent with an adopted qualified Greenhouse Gas Reduction Strategy, it can be presumed that the project will not have significant GHG emissions under CEQA.[6] The BAAQMD also developed a quantitative threshold for project- and plan-level analyses based on estimated GHG emissions, as well as per capita metrics.

City of Mountain View GHG Reduction Program

The City has developed several policies and plans that serve as GHG emissions reduction strategies, including the following:

- Greenhouse Gas Reduction Program (GGRP): Created in 2012, the GGRP sets forth greenhouse gas emissions reduction targets for development projects, based on daytime service population, (i.e., population and workers) with prescribed greenhouse gas mitigation measures to offset the environmental impacts of implementing the General Plan.
- Climate Protection Roadmap (CPR): The CPR, completed in 2015, presents a projection of GHG emissions through 2050 and a number of strategies that would help the City reduce absolute communitywide GHG emissions 80 percent below 2005 levels by 2050.
- Municipal Operations Climate Action Plan (MOCAP): This plan, approved in 2015, guides the City's municipal operations GHG emissions reduction efforts. Like the CPR, the MOCAP provides specific strategies for reducing absolute emissions 80 percent below 2005 levels by 2050.
- Environmental Sustainability Action Plans (ESAPs): The first two plans, ESAP-1 and ESAP-2, guided the City's actions to meet general sustainability goals, and grew out of the City-appointed 2008 Environmental Sustainability Task Force. The current plan, ESAP-3, was developed based on actions in the CPR and MOCAP.

The City's GGRP meets the requirements of a GHG Reduction Strategy under State CEQA Guidelines Section 15183.5[7]. The program includes a goal to improve communitywide emissions efficiency (per-service population – residents and full-time employees) by 15 to 20 percent over 2005 levels by 2020 and by 30 percent over 2005 levels by 2030. The GGRP implements the following goal, policy, and actions from the Mountain View General Plan Mobility Element:

Goal MOB-9: Achievement of state and regional air quality and greenhouse gas emission reduction targets

> ***Policy MOB 9.1 Greenhouse gas emissions:*** Develop cost-effective strategies for reducing greenhouse gas emissions in coordination with the Greenhouse Gas Reduction Program.

[6] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.
[7] AECOM. 2012. City of Mountain View Greenhouse Gas Reduction Program. August.

- *Action MOB 9.1.1 Greenhouse Gas Inventory: Maintain and regularly update the City's municipal and community Greenhouse Gas Inventory to track emissions.*
- *Action MPB 9.1.2 Greenhouse Gas Reduction Program: Regularly update the Greenhouse Gas Reduction Program to address transportation emissions reductions.*

In 2015, the City prepared a 2015 Community Greenhouse Gas Emissions Inventory that found GHG emissions to be about 9 percent higher than the City's adjusted GGRP target. The City's 2005 emission inventory was adjusted for the 2015 modeling to include updated modeling methodologies. The City had established a goal to reduce the estimated 2005 emissions by 10 percent in 2015. The majority of 2015 emissions were associated with transportation. While substantial reductions occurred with emissions associated with energy, solid waste and water, there was a 22 percent increase in transportation-related emissions.

Transportation emissions, which make up nearly 60 percent of the inventory, increased by 22 percent over 2005 levels as employment in Mountain View increased at a much greater rate than population. Employees, many that travel substantial distances to Mountain View, now outnumber residents. Balancing employment and housing are key to achieving the GGRP goal.

Energy-related emissions made up nearly 33 percent of the inventory. These emissions are primarily associated with electricity and natural gas consumption. Energy emissions decreased by nearly 15 percent, with the greatest reductions occurring recently. In 2017, Silicon Valley Clean Energy (SVCE) began providing 100 percent carbon-free electricity to residents and businesses in Mountain View, with over 98-percent participation. The reduction in electricity GHG emissions is not reflected in the 2015 inventory but will be reflected in subsequent inventories.

PROJECT IMPACTS AND MITIGATION MEASURES

Significance Criteria

Per Appendix G of the CEQA Guidelines and BAAQMD recommendations, air quality and GHG impacts are considered significant if implementation of the EWPP would:

1) Conflict with or obstruct implementation of an applicable air quality plan.
2) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
3) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
4) Expose sensitive receptors to substantial pollutant concentrations.
5) Create objectionable odors affecting a substantial number of people.

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

The City uses the significance thresholds recommended by BAAQMD in its latest update to the CEQA Air Quality Guidelines. In response to the legal issues, BAAQMD revised its CEQA Guidelines in May 2017. The thresholds identified in Table 1 represent the most recent guidance provided by BAAQMD that are used by the City of Mountain View to assess Plan-level impacts. Project-level thresholds are shown in Table 2. The project-level thresholds would be applied to the analysis of project-specific impacts. Unlike project thresholds, there are no quantified emission thresholds that are applied to the evaluation of plan impacts. Though not necessarily a CEQA issue, the effect of existing TAC sources on future EWPP receptors (residences) is analyzed to comply with BAAQMD's Clean Air Plan key goal of reducing population TAC exposure and protecting public health in the Bay Area.

TABLE 1. BAAQMD Recommended Plan-Level Air Quality Significance Thresholds

Pollutant/Contaminant	Construction Related	Operational
Criteria Air Pollutants and Precursors	None	1. Consistency with Current Air Quality Plan control measures, and 2. Projected VMT or vehicle trip increase is less than or equal to projected population increase
GHGs	None	Compliance with Qualified GHG Reduction Strategy OR 6.6 MT CO2e/SP/yr (residents + employees) For this analysis, the City's GGRP 2030 threshold is applied: 1. 4.5 metric tons per capita in 2030*
Risks and Hazards	None	1. Overlay zones around existing and planned sources of TACs (including adopted Risk Reduction Plan areas) and 2. Overlay zones of at least 500 feet from all freeways and high-volume roadways For this analysis – overlay zones are based on potential for sources to result in the following impacts: 1. Excess cancer risk >10.0 chances per million 2. Annual PM2.5 Concentration > 0.3 $\mu g/m^3$ 3. Hazard Index >1.0
Odors	None	Identify the location, and include policies to reduce the impacts, of existing or planned sources of odors
* Mountain View's GGRP established efficiency metric for 2030		

TABLE 2. BAAQMD Recommended Project-Level Air Quality Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)**	
Excess Cancer Risk	>10.0 per one million	>100 per one million	
Hazard Index	>1.0	>10.0	
Incremental annual $PM_{2.5}$	>0.3 µg/m^3	>0.8 µg/m^3	
Odors	**Complaints**	**Complaints**	
	No threshold	5 confirmed complaints per year averaged over three years	
Greenhouse Gas Emissions			
Land Use Projects – direct and indirect emissions		Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons or 4.6 metric tons per capita in 2020 and 4.5 metric tons per capita in 2030*	

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.

* Mountain View's GGRP established efficiency metric for 2030

Note that BAAQMD's recommended GHG threshold of 1,100 metric tons or 4.6 metric tons per capita was developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development within the EWPP area would occur beyond 2020, so a threshold that addresses a future target is appropriate. The City's GGRP establishes a goal to improve community wide per- SP emissions efficiency by 30% over 2005 levels by 2030. The efficiency metric used for 2030 is 4.5 MT CO_{2e}/SP/yr.

Impact 1: Conflict with or obstruct implementation of an applicable air quality plan?

BAAQMD is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the SFBAAB. BAAQMD, with assistance from ABAG and MTC, has prepared and implements specific plans to meet the applicable laws, regulations, and programs. The most recent and comprehensive of which is the *Bay Area 2017 Clean Air Plan*.[8] The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHGs.

Consistency of the EWPP with Clean Air Plan control measures is demonstrated by assessing whether the proposed Plan implements the applicable Clean Air Plan control measures. The 2017 Clean Air Plan includes control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The control measures are divided into five categories that include:

- 40 measures to reduce stationary and area sources;
- 8 mobile source measures;
- 23 transportation control measures (including land use strategies);
- 4 building sector measures;
- 2 energy sector measures;
- 4 agriculture sector measures;
- 3 natural and working lands measures;
- 4 waste sector measures;
- 2 water sector measures; and
- 3 super-GHG pollutants measures.

In developing the control strategy, BAAQMD identified the full range of tools and resources available, both regulatory and non-regulatory, to develop each measure. Implementation of each control measure will rely on some combination of the following:

- Adoption and enforcement of rules to reduce emissions from stationary sources, area sources, and indirect sources.
- Revisions to the BAAQMD's permitting requirements for stationary sources.
- Enforcement of CARB rules to reduce emissions from heavy-duty diesel engines.

[8] Bay Area Air Quality Management District (BAAQMD), 2017. *Final 2017 Clean Air Plan.*

- Allocation of grants and other funding by the Air District and/or partner agencies.
- Promotion of best policies and practices that can be implemented by local agencies through guidance documents, model ordinances, and other measures.
- Partnerships with local governments, other public agencies, the business community, non-profits, and other groups.
- Public outreach and education.
- Enhanced air quality monitoring.
- Development of land use guidance and CEQA guidelines, and Air District review and comment on Bay Area projects pursuant to CEQA.
- Leadership and advocacy.

This approach relies upon lead agencies to assist in implementing some of the control measures. A key tool for local agency implementation is the development of land use policies and implementing measures that address new development or redevelopment in local communities. To address this impact, the EWPP's effect on implementing the Clean Air Plan is evaluated based on consistency with Clean Air Planning projections (i.e., rate of increase in population versus vehicle travel) and

Consistency with Clean Air Plan Projections

The BAAQMD, with assistance from ABAG and MTC, has prepared and implemented the Clean Air Plan to meet the applicable laws, regulations, and programs. The primary goals of the Clean Air Plan are to attain air quality standards, reduce population exposure and protect public health, and reduce GHG emissions and protect the climate. The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHG. To assess plan-level impacts, the BAAQMD CEQA Air Quality Guidelines recommend that the projected VMT or vehicle trip increase is compared to the projected population increase. Impacts would be considered significant if the rate of VMT increase is greater than population increase.

Daily vehicle miles traveled (VMT), population and number of employees for build out of the EWPP area were provided by the project traffic consultant. Using the "Existing Conditions" as a baseline condition, VMT attributable to the EWPP is anticipated to increase 98 percent at build-out. Under cumulative conditions, VMT would increase 115% above Existing Conditions. The EWPP Plan is estimated to increase the residential population by 10,570 people from 2,070 persons at build out, a 511-percent increase. Under cumulative conditions, population would increase population by 10,630 people, or a 519-percent increase. The EWPP would also increase the number of employees. The projected VMT per capita, which includes the combination of population and workers, would decrease from 19.1 miles to 18.0 miles for EWPP conditions and 18.1 miles for Cumulative plus EWPP conditions. Table 3 compares VMT, population and employment for the existing, EWPP and Cumulative conditions.

TABLE 3 Summary of Existing and Future Vehicle Miles Traveled and Service Population

Metric/ Variable	Existing	2030 Existing plus EWPP	Percentage Increase over Existing	2030 Cumulative plus EWPP	Percentage Increase over Existing
Daily VMT	338,310	668,250	98%	728,730	115%
Population	2,070	12,640	511%	12,820	519%
Employment	15,630	24,560	57%	27,360	75%
VMT/Capita	19.1	18.0		18.1	

As shown in Table 3, the rate of VMT growth would be less than the rate of population growth. As a result, growth under the General Plan assumptions was found to be consistent with the Clean Air Plan. The VMT was computed at 19.1 miles per service population under Existing Conditions and would increase to 19.5 miles under Cumulative Conditions. The VMT per capita would decrease to 18.0 miles under Existing plus EWWP and 18.1 miles under Cumulative plus EWPP. The EWPP VMT growth rate would not exceed the population growth, and therefore, would be consistent with the Clean Air Plan from a VMT perspective.

Consistency with Clean Air Plan Control Measures

The Guidelines set forth criteria for determining consistency with the Clean Air Plan control measures. In general, a plan is considered consistent if a) the plan supports the primary goals of the Clean Air Plan; b) includes control measures; and c) does not interfere with implementation of the Clean Air Plan measures. EWPP is a considered a sustainable development since it is an infill development that would be transit-oriented and located near a mix of uses that include employment and services. As a result, these types of communities reduce the rate of per capita VMT. As a sustainable development, the EWPP would generally be consistent with Clean Air Plan measures intended to reduce automobile and energy use, which are discussed below. Table 4 lists those Clean Air Plan policies relevant to the EWPP and indicates consistency with the policies.

TABLE 4 BAAQMD Control Strategy Measures

Applicable BAAQMD Control Strategy Measures	Consistency
Transportation Control Measures	
TR1: Clean Air Teleworking Initiative	Consistent The EWPP would require implementation of a TDM program, which would include measures such as increased support for telecommuting
TR2: Trip Reduction Programs	Consistent The EWPP would require implementation of a TDM program, which would include measures such as transit subsidies, carpool incentives, bicycling incentives, carshare memberships, and/or vanpools.
TR 5: Transit Efficiency and Use	Consistent While this is mostly a regionally implemented control measure, the EWPP would provide connections to regional and local transit with its convenient location near the Great America and Lafayette transit stations.
TR7: Safe Routes to Schools and Safe Routes to Transit	Consistent The EWPP would ensure clear and safe pedestrian circulation. Convenience, safety and integrated access would be prioritized for all modes of transportation.
TR8: Ridesharing, Last-Mile Connection	Consistent The EWPP would require implementation of a TDM program, which may include measures such as carpool incentives, carshare memberships, additional Last Mile services, and/or vanpools.
TR9: Bicycle and Pedestrian Access and Facilities	Consistent The EWPP would result in a dense, walkable environment, simplify wayfinding, and ensure clear and safe pedestrian circulation.
TR10: Land Use Strategies	Consistent The EWPP would design new buildings around walkable streets and close to transit, creating opportunity for more sustainable transportation modes less reliant on the car.
TR13: Parking Policies	Consistent The EWPP would reduce demand for parking through design, transit accessibility and TDM programs.
Building Control Measures	
BL1: Green Buildings	Consistent The EWPP would meet new Title 24 standards as well as City requirements.

Applicable BAAQMD Control Strategy Measures	Consistency
BL2: Decarbonize Buildings	Consistent The EWPP would utilize energy generation through on-site photovoltaic on buildings. EWPP buildings would avoid natural gas use. In addition, the EWPP aims for net zero energy on-site over time as the electricity provider, Silicon Valley Power, strives to provide carbon free generated electricity to their Santa Clara customers as well as the purchase of renewable energy credits
BL4: Urban Heat Island Mitigation	Consistent The EWPP would reduce cooling load by maximizing shade through tree planting and natural foliage.
Natural and Working Lands Control Measures	
NW2: Urban Tree Planting	Consistent The EWPP would provide a comfortable, well-shaded environment defined by a consistent, linear plating plan along the streets and a variety of trees in parks and greenways.
Waste Management Control Measures	
WA4: Recycling and Waste Reduction	Consistent The EWPP would include visible recycling and composting stations in the public realm and include public awareness campaigns for all users. The EWPP would provide means for waste separation at point of collection.
Water Control Measures	
WR2: Support Water Conservation	Consistent EWPP would maximize water reuse. EWPP buildings would reduce water fixture use below Code minimum requirements through efficient devices and behavioral interventions. Irrigation water would rely on reclaimed water and be minimized through the use of drip systems. Dual plumbing would be installed in all buildings to use reclaimed water for toilet/urinal flushing.

As indicated in Table 4, the EWPP would include implementing policies and measures that are generally consistent with the applicable Clean Air Plan control measures.

Impact 2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The Bay Area is considered a non-attainment area for ground-level ozone and $PM_{2.5}$ under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM_{10} under the California Clean Air Act, but not the federal act. The area has attained both state and federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and particulate matter (i.e., $PM_{2.5}$ and PM_{10}), the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NOx), PM_{10}, and $PM_{2.5}$ and apply to both construction period and operational period impacts for projects. They do not apply to plans, such as EWPP.

Past, present and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to by itself, result in nonattainment of ambient air quality standards. Instead a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

<u>EWPP Construction Emissions</u>

Implementation of the Plan would result in temporary emissions from construction activities associated with subsequent development, including demolition, site grading, asphalt paving, building construction, and architectural coating. Emissions commonly associated with construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips. During construction, fugitive dust, the dominant source of PM_{10} and $PM_{2.5}$ emissions, is generated when wheels or blades disturb surface materials. Uncontrolled dust from construction can become a nuisance and potential health hazard to those living and working nearby. The potential health risk impact from construction is discussed under Impact 4.

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less-than-significant if best management practices are implemented to reduce these emissions. *Mitigation Measure AQ-1 would implement BAAQMD-recommended best management practices*.

Construction exhaust emissions include those from equipment (i.e., off-road) and traffic (on-road vehicles and trucks). Off-road construction equipment is often diesel-powered and can be a substantial source of NO_X emissions, in addition to PM_{10} and $PM_{2.5}$ emissions. Architectural coatings and application of asphalt pavement are dominant sources of ROG emissions. The BAAQMD CEQA Air Quality Guidelines do not identify quantified plan level thresholds for construction emissions. There are project-level thresholds of 54 pounds per average day for NOx, ROG and $PM_{2.5}$ exhaust and 82 pounds per average day for PM_{10} exhaust. Unless controlled, the combination of temporary dust from activities and diesel exhaust from construction equipment and related traffic may pose a nuisance impact to nearby receptors or exceed acceptable levels for projects. In addition, NO_X emissions during grading and soil import/export for large projects may exceed the BAAQMD NO_X emission thresholds for projects.

Without application of appropriate control measures to reduce construction dust and exhaust, construction period impacts at the program level would be considered a *potentially significant impact*. *Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce this impact to a level of less than significant.*

Mitigation Measure AQ-1: Implement BAAQMD-Recommended Measures to Control Particulate Matter Emissions during Construction for all EWPP Construction Activity.

Measures to reduce NOx, ROG, diesel particulate matter and fugitive particulate matter from construction are recommended to reduce emissions and ensure that short-term health impacts to nearby sensitive receptors are avoided.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign(s) with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
- The contractor shall install temporary electrical service whenever possible to avoid the need for independently powered equipment (e.g. compressors).

Mitigation Measure AQ-2 Require Project-Level Construction Assessment for Projects in the EWPP.

Construction criteria pollutant and TAC quantification shall be required on individual projects developed under the EWPP once those details are available through modeling to identify impacts and, if necessary, include measures to reduce emissions below the applicable BAAQMD construction thresholds. Reductions in emissions can be accomplished through, though is not limited to, the following measures:

- Construction equipment selection for low emissions;
- Use of alternative fuels, engine retrofits, and added exhaust devices;
- Low-VOC paints;
- Modify construction schedule; and
- Implementation of BAAQMD Basic and/or Additional Construction Mitigation Measures for control of fugitive dust.

Effectiveness of Mitigation Measures AQ-1 and AQ-2

Site-specific construction schedules and equipment are not known at this time for the future development area and have not been quantified at the project level. Implementation of Mitigation Measure AQ-1 would ensure that all construction projects employ the proper *BAAQMD-Recommended Measures to Control Particulate Matter Emissions* and Mitigation Measure AQ-2 would ensure that construction of future development areas under the EWPP would be analyzed through project-level review to quantify construction criteria pollutant emissions and identify the specific measures needed to reduce potential impacts, as necessary. *Therefore, with implementation of Mitigation Measure AQ-1 and AQ-2, the potential impact from construction of individual construction projects within the future development in the EWPP area would be reduced to a level of less than significant.*

Operational Period Emissions

Implementation of the EWPP would result in long-term area and mobile source emissions from operation and use of subsequent development projects. Operational emissions associated with the EWPP were computed for informational purposes. There are no thresholds applicable to emissions associated with plan-level development; however, there are project-level thresholds. For annual emissions, these are emissions of 10 tons for ROG, NOx or $PM_{2.5}$ and 15 tons for PM_{10}. For average daily emissions, these are 54 pounds for ROG, NOx or $PM_{2.5}$ and 82 pounds for PM_{10}.

<u>Modeling Assumptions</u>

Operational air emissions from the project would be generated primarily from autos driven by future residents and employees. Evaporative emissions from architectural coatings and maintenance products (classified as consumer products) are typical emissions from these types of uses. CalEEMod was used to predict emissions from Existing and Cumulative conditions with and without EWPP, assuming 2030 full buildout.

Land Uses
The EWPP land uses were input to CalEEMod. The following land uses types and sizes were input to CalEEMod:

Existing 2017 and 2030

- 899 dwelling unit entered as "Condo/Townhouse;"
- 54,000 square feet (sf) "Strip Mall"/commercial/retail;
- 3,042,000 sf entered as "General Office Building;" and
- 2,609,000 sf entered as "Research & Development;"

Existing + EWPP 2030

- 5,899 dwelling unit entered as "Condo/Townhouse;"
- 154,000 square feet (sf) "Strip Mall"/commercial/retail;
- 7,555,000 sf entered as "General Office Building;" and
- 396,000 sf entered as "Research & Development;"
- 200 rooms entered as "Hotel."

Model Year
Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The baseline year for existing conditions was entered as 2017 and the operational year was 2030.

Consumer Products

CalEEMod computes emissions associated with consumer products[9] for all land uses, regardless of their types. ROG emissions from consumer products are forecasted to decrease, as shown in the CARB county emissions forecasts for 2010 through 2030. A factor to adjust the ROG consumer was developed based on the change in the per population ROG consumer emissions between 2008 and 2030. Essentially, the 2030 rate is anticipated to be 78 percent of the 2008 rate that CalEEMod uses.

Energy
The 2016 Title 24 Building Standards became effective January 1, 2017 and are assumed to be included in this current version of CalEEMod. Energy consumption rates for the existing uses were based on historical default conditions in CalEEMod for Existing Conditions and project default rates for future modeled conditions.

Electricity Generation
Default rates for energy consumption were assumed in the model for existing conditions. Development under the EWPP is anticipated to occur in 2020 or subsequent years. Therefore, new construction would be subject to new 2019 Title 24 building standards that would greatly increase energy efficiency and require rooftop solar energy production. According to the California Energy Commission, single-family homes built with the 2019 standards are anticipated to use about 7 percent less energy due to energy efficiency measures versus those built under the 2016 standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use about 53 percent less energy than those under the 2016 standards. Nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades[10]. To account for these new standards, an overall improvement of 30 percent in Title 24 energy usage was assumed in CalEEMod.

In 2017, Silicon Valley Clean Energy (SVCE) began providing 100 percent carbon-free electricity to residents and businesses, with over 98-percent participation in Mountain View. There are essentially no electricity-related emissions. However, a 10-percent non-participation rate was assumed for build-out of the EWPP. For these emissions, PG&E rates were assumed. CalEEMod has a default rate of 641.3 pounds of CO2 per megawatt of electricity produced, which is based on PG&E's 2008 emissions rate. In 2018, PG&E reported that their GHG-emission rate fell to 294

[9] Per the CalEEMod User's Guide: "Consumer products are chemically formulated products used by household and institutional consumers, including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products"
[10] California CEC. 2018. 2019 Building Energy Efficiency Standards. See: https://www.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf accessed December 13, 2018.

pounds per megawatt-hour of electricity delivered[11]. For the 2030 modeling, emissions rates associated with electricity consumption were adjusted to account for PG&E's projected 2020 CO2 intensity rate in place of 2030, since 2020 is the latest year published to date. This 2020 rate is based, in part, on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. The derived 2020 rate for PG&E was estimated at 289 pounds of CO2 per megawatt of electricity delivered and is based on the California Public Utilities Commission (CPUC) GHG Calculator. Default model assumptions for GHG emissions associated with area sources, solid waste generation and water/wastewater use were applied.

Other Inputs

Default model assumptions for emissions associated with solid waste generation and water/wastewater use were applied to the project.

Traffic Modeling – EMFAC2014

The EWPP Traffic study provided trip generation rates, assumed to be weekday rates, along with the VMT projections for each study scenario. The trip rates and VMT were used along with EMFAC2014 emission rates to predict operational mobile source emissions.

Modeling Results

Table 5 reports the predicted emissions from complete build out of the EWPP area in terms of annual emissions in tons and average daily operational emissions, assuming 365 days of operation per year. Net emissions between the proposed EWPP area and existing uses are also shown. There are no emission thresholds that apply to potential emissions generated by a plan, such as the EWPP.

TABLE 5 2030 Operational Air Pollutant Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
2017 Existing Operational Emissions	47.33 tons	65.65 tons	20.69 tons	7.05 tons
2030 Existing Operational Emissions	39.63 tons	46.75 tons	10.78 tons	4.27 tons
2030 EWPP Operational Emissions	68.54 tons	86.35 tons	20.38 tons	7.56 tons
2030 Net Operational Emissions (tons)	28.91 tons	39.60 tons	9.60 tons	3.29 tons
Average Daily Net Operational Emissions (pounds)[1]	158.4 lbs/day	217.0 lbs/day	52.6 lbs/day	18.0 lbs/day
Notes: [1] Assumes 365-day operation.				

[11] PG&E. 2018. *Currents, - News and Perspectives from Pacific Gas and Electric Company for December 11, 2018*. March. See: https://www.pgecurrents.com/2018/03/26/independent-registry-confirms-record-low-carbon-emissions-for-pge/ accessed December 11, 2018.

Impact 3: Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

As discussed above, implementation of the EWPP would have emissions that affect ozone and particulate matter. These are considered regional air pollutant issues and are addressed by evaluating a project, or plan's, contribution to the cumulative impact. CO is a pollutant affected by localize emissions, primarily from traffic.

Monitoring data from all ambient air quality monitoring stations in the Bay Area indicate that existing carbon monoxide levels are currently below national and California ambient air quality standards. Monitored CO levels have decreased substantially since 1990 as newer vehicles with greatly improved exhaust emission control systems have replaced older vehicles. The Bay Area has been designated as an attainment area for the CO standards. The highest measured levels in the Bay Area during the past three years are 3.0 ppm or less for eight-hour averaging periods, compared with state and federal criteria of 9.0 ppm.

Even though current CO levels in the Bay Area are well below ambient air quality standards, and there have been no exceedances of CO standards in the Bay Area since 1991, elevated levels of CO still warrant analysis. CO hotspots (occurrences of localized high CO concentrations) could still occur near busy congested intersections. Recognizing the relatively low CO concentrations experienced in the Bay Area, the BAAQMD's CEQA Air Quality Guidelines state that a project would have a less-than-significant impact if it would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. Peak hour traffic volumes at intersections affected by implementation of the EWPP area would be less than 20,000 per hour. Therefore, this impact would be less than significant.

Impact 4: Expose project sensitive receptors to substantial pollutant concentrations during operation?

For assessing Plan-Level impacts, the BAAQMD CEQA Air Quality Guidelines recommend that community risk assessments include overlay zones around existing and planned sources of TACs. The analysis of the effect of TACs on sensitive receptors is typically undertaken at the project-level analysis. This analysis identifies the overlay zones based on TAC emissions from existing sources in or near the EWPP area. At this time, sources of TAC emissions that could be developed in the EWPP have not been identified. Traffic associated with EWPP development would be a source of TAC emissions; however, these emissions would be distributed across a broad area and not at any one location. Community risk impacts are addressed two ways in this analysis:

1. Identify existing sources of TACs and their potential influence based on BAAQMD Screening tools[12] and dispersion modeling for the larger sources (e.g., U.S. Highway 101 and State Route 237, both freeways).
2. Qualitatively assess potential increases in TAC levels caused by projects constructed under the EWPP. Note that there are no thresholds to describe community risk impacts caused by a plan, such as the EWPP.

Sources of TACs Affecting EWPP

As discussed above, in December 2015, the Supreme Court determined that an analysis of the impacts of the environment on a project – known as "CEQA-in-reverse" – is only required under two limited circumstances: (1) when a statute provides an express legislative directive to consider such impacts; and (2) when a proposed project risks exacerbating environmental hazards or conditions that already exist (Cal. Supreme Court Case No. S213478). However, the Clean Air Plan contains the following goal: "reduce population exposure and protecting public health in the Bay Area." In addition, the potential effect of existing TAC sources on future projects is discussed to comply with General Plan Policy INC 20.7 to "protect the public from substantial pollutant concentrations." Therefore, the potential community risk impact to future onsite receptors is addressed here.

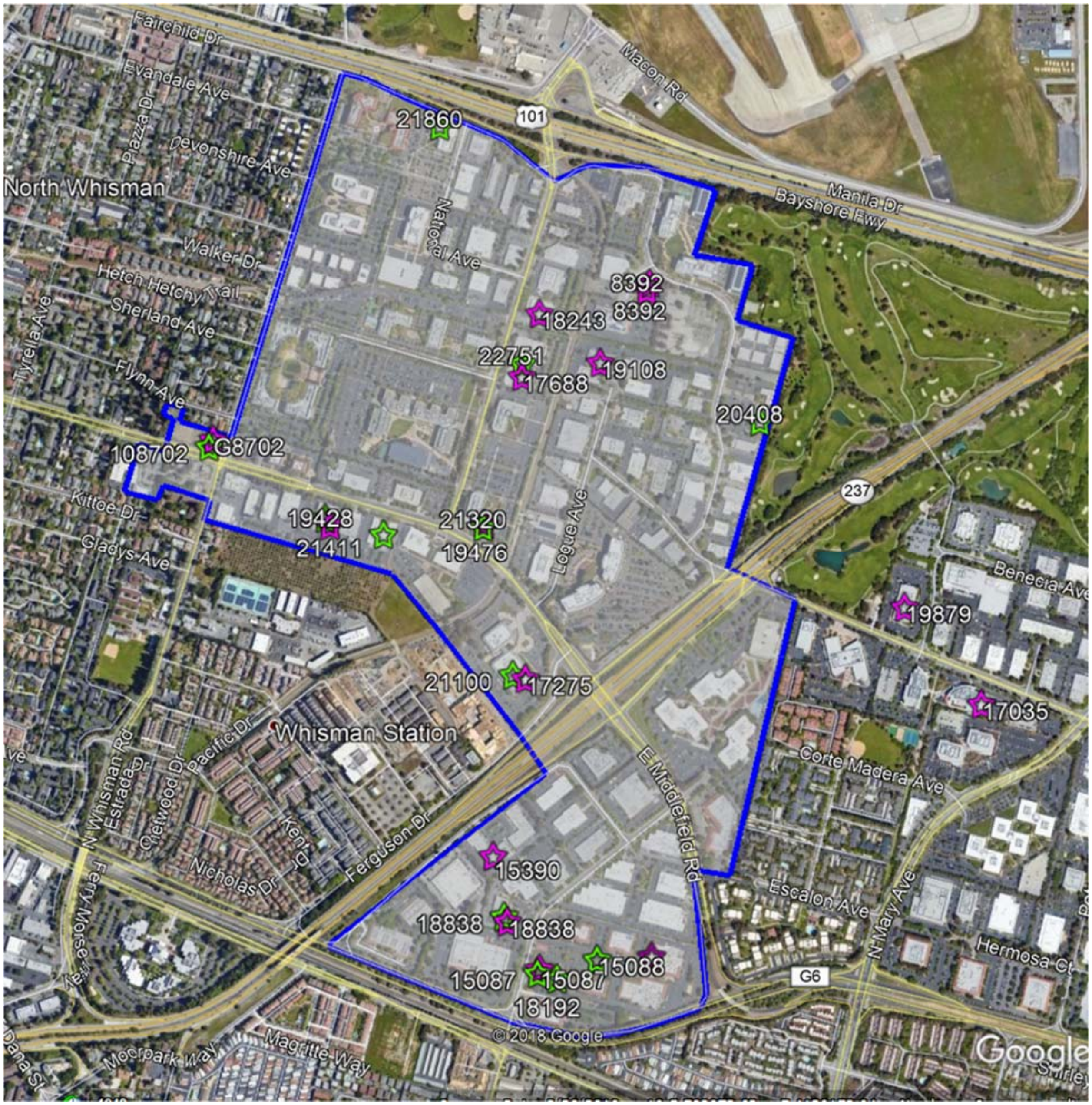
To address exposure of sensitive receptors to substantial pollutant levels, the BAAQMD CEQA Guidelines developed thresholds that address community health risk. These include increased cancer risk, non-cancer hazards and increased annual concentrations of $PM_{2.5}$. Sources of TACs and $PM_{2.5}$ lead to increased community risk levels. Diesel particulate matter, or DPM, is the predominant TAC in the area.

BAAQMD recommends using a 1,000-foot screening radius around a project site for purposes of identifying community health risk from siting a new sensitive receptor or a new source of TACs. Nearby stationary sources of TACs (e.g., emergency back-up generators and gas stations) and traffic on local roadways could affect the proposed residences. There is the CalTrain rail line located about 200 feet south of a portion of the EWPP boundary. CalTrain is currently undergoing a modernization plan that would transition the rail line to mostly electric-powered trains over the next five years. There would be infrequent freight train use in the future but not at a level that would produce significant risks at the EWPP area.

[12] BAAQMD Screening Tools include the Highway Screening Analysis Tool, Stationary Source Screening Analysis Tool, and the Roadway Screening Analysis Calculator. These tools are available at http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools, accessed December 10, 2018.

Figure 1 shows the EWPP area, the 1,000-foot influence area and the nearby stationary sources. Busy nearby roadways include U.S. Highway 101, State Route (SR) 237, North Whisman Road, East Middlefield Road, and Central Expressway.

Figure 1 EWPP Area and 1,000-foot Influence Area with Identified Stationary Sources



Community Risk Impact Evaluation 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.[13] 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. CARB has provided additional guidance on implementing OEHHA's recommended methods.[14] This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. While the OEHHA guidelines use substantially more conservative assumptions than the current BAAQMD guidelines, BAAQMD has not formally adopted recommended procedures for applying the newest OEHHA guidelines. BAAQMD is in the process of developing new guidance and has provided initial information on exposure parameter values they are proposing for use.[15] In order to be conservative, the OEHHA guidelines and newly recommended BAAQMD exposure parameters were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, 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. 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 or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, 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), 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. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

[13] 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.

[14] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

[15] Email from Virginia Lau, BAAQMD to Bill Popenuck of Illingworth & Rodkin, Inc, dated November 15, 2015.

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)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized in Table 6.

TABLE 6 Community Risk Parameters Used for Cancer Risk Calculations

Parameter	***Exposure Type***	**Infant**		**Child**	**Adult**
	Age Range	**3rd Trimester**	**0<2**	**2 < 16**	**16 - 30**
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	572	261
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14
Exposure Frequency (days/year)		350	350	350	350
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home		1.0	1.0	1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults.

Non-Cancer Hazards

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). 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 BAAQMD 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 diesel particulate matter or DPM. For DPM, the chronic inhalation REL is 5 $\mu g/m^3$. BAAQMD Tools (i.e., Highway Screening Tool and Roadway Screening Calculator) indicate that health hazards from roadways are well below the significance thresholds.

$PM_{2.5}$ Concentrations

While not a TAC, $PM_{2.5}$ has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under CEQA. The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects involving construction, $PM_{2.5}$ impacts should include those from construction equipment and vehicle exhaust in addition to fugitive dust impacts from construction activities. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

TAC Sources Evaluated

Stationary Sources

The Planning Area has numerous permitted stationary sources. These sources are located throughout the Plan Area, in manufacturing and commercial areas. The impact of these sources can only be addressed on a project-by-project basis, since impacts are generally localized. To assist lead agencies, BAAQMD has provided a database of permitted sources for each County. The database is contained in a Google Earth tool that allows a user to identify stationary sources within 1,000 feet of a receptor. The database can then be accessed through Google Earth to determine conservative screening levels of cancer risk, hazards and $PM_{2.5}$ concentrations. This allows many of the sources to be screened out of any additional analysis. Stationary sources that show the potential for significant community risk impacts after this first level of review are further analyzed by contacting BAAQMD for additional information and applying distance adjustment factors. A refined modeling analysis would be required if there are sources that still have potentially significant impacts after this level of review. A refined analysis would include dispersion modeling of the source using emissions and source information provided by BAAQMD. If the source still has significant community risk impacts following this level of effort, then risk reduction strategies would have to be implemented by the project on a case-by-case basis, including but not limited to, mechanical air filtration systems. The reported screening risk values are assumed to be at a distance of 50 feet.

When siting new sensitive receptors, the BAAQMD Guidelines advise that lead agencies examine existing or future proposed sources of TAC and/or $PM_{2.5}$ emissions that would adversely affect individuals within the planned project. New residences and sensitive receptors could be located near stationary sources of TACs located throughout the Planning Area, such as gasoline dispensing stations, emergency back-up diesel generators, and dry cleaners. Without proper setbacks or mitigation measures, these sources could result in TAC levels that are considered significant for new sensitive receptors.

Gasoline Stations. The Plan Bay Area DEIR[16] recommends a screening setback of 300 feet for large gasoline dispensing facilities (3.6 million gallons of throughput a year) and 50 feet for small facilities.

Emergency Back-Up Generators. Electricity generators that are powered by diesel engines are common. They are typically located at facilities where uninterrupted electricity is necessary. Common facilities include fire and police stations, hospital or medical treatment facilities, pump stations, schools, offices, and data centers. Diesel engines powering these generators are regulated by BAAQMD and CARB. CARB has established strict emissions limits and operating restrictions for engines larger than 50 horsepower. BAAQMD has developed criteria (Regulation 2 Rule 5) for approval of projects with new or modified emission sources of TACs. As a result, all new engines have very localized impacts and would not be permitted if they would cause significant cancer risks or hazards. Existing engines are permitted to operate for a maximum of 50 hours per year for maintenance or routine testing.

Moffett Airfield. Located to the north of the Plan Area, Moffett Federal Airfield contains multiple sources of TACs.

[16] Association of Bay Area Governments, Metropolitan Transportation Commission, 2013. *Draft Plan Bay Area Environmental Impact Report*. State Clearinghouse No. 2012062029. April.

Screening Setback Distances

Specific stationary sources in the Plan Area were identified using BAAQMD's Google Earth *Stationary Source Screening Analysis Tool*, as described above. The BAAQMD data provide the screening risk, hazard and $PM_{2.5}$ concentration levels associated with each source. Table 7 identifies the approximate setback distances from stationary sources that have potentially significant impacts using the screening data provided by BAAQMD and the *Cancer Risk and Hazard Distance Adjustment Multiplier* tool. The predicted cancer risk was then adjusted using a factor of 1.3744 to account for the 2015 OEHHA guidance.[17] However, refined analysis of the effects from these sources through emissions and dispersion modeling would likely show lower TAC exposure. It should be noted that certain stationary sources could be removed as part of implementation of the EWPP, thus removing their associated community risk. Stationary sources that do not have potentially significant impacts at 50 feet or greater were not included in Table 7.

<u>TAC Impacts - Local Surface Streets</u>

Traffic on high volume roadways (e.g., N. Whisman Road and E. Middlefield Road) is a source of TAC emissions that may adversely affect sensitive receptors in close proximity to the roadway. For roadways, BAAQMD has published a screening calculator to determine if roadways with traffic volumes of over 10,000 vehicles per day may have a significant effect on a proposed project. For Santa Clara County, north-south directional roadways with average daily traffic (ADT) volumes of 30,000 or greater would have potentially significant risk impacts within 50 feet. For east-west directional roadways, potentially significant risks within 50 feet would occur for roadways with ADT of 20,000 or greater. A screening analysis of the roadways with the highest traffic volumes was conducted. Table 8 reports the screening distances for local roadways.

[17] Correspondence with Alison Kirk, BAAQMD. November 23, 2015.

TABLE 7. Approximate Screening Setback Distances for Stationary TAC Sources

Source	Screening Distance in Feet to Cancer Risk Threshold	Screening Distance in Feet to $PM_{2.5}$ Threshold
Stratify, Inc. Plant 18243, 501 Ellis Street	495	<50
Access Closure Plant 19662, 645 Clyde Avenue	No data	No data
AOL, Inc. Plant 17688, 475 Ellis Street	1,000	83
Hitachi Chemical Diagnostics, Inc. Plant 8392, 630 Clyde Court	495	<50
SolFocus, Inc. Plant 19108, 510 Logue Avenue	495	<50
Renault & Handley Plant 19428, 401 E. Middlefield Road	330	<50
KPMG Plant 19476, 500 E. Middlefield Road	231	<50
PalmOne Inc. Plant 17035, 950 W. Maude Avenue	264	<50
RREEF Property Management Plant 19879, 501 Macara Avenue, Sunnyvale	No data	No data
Rotten Robbie Plant G8702, 310 Whisman	148	0
VeriSign, Inc. Plant 17275, 685 E. Middlefield Road	793	<50
DePuy Spine Plant 15390, 365 Ravendale Drive	727	<50
MTV Research LLC c/o Parkway Properties Plant 18838, 350 Bernardo Avenue	462	<50
MedImmune Vaccines, Inc. Plant 15088, 319 N. Bernardo Avenue	528	<50
MedImmune Vaccines, Inc. Plant 15087, 297 N. Bernardo Avenue	661	<50

TABLE 8. Approximate Screening Setback Distances for Local Roadway TAC Sources

Street/Segment	Screening Distance in Feet to Cancer Risk Threshold	Screening Distance in Feet to $PM_{2.5}$ Threshold
E. Middlefield Rd / west of N. Whisman	North: <25 South: <25	North: <25 South: 25
E. Middlefield Rd / west of Ellis St	North: <25 South: <25	North: <25 South: 35
E. Middlefield Rd / west of SR 237	North/east: 75 South/west: 25	North/east: 75 South/west: 50
E. Middlefield Rd / west of Central Expressway	North/east: 75 South/west: 30	North/east: 75 South/west: 60
N. Whisman Rd. / south of E. Middlefield	East: 60 West: <25	East: 75 West: <25
N. Whisman Rd. / north of E. Middlefield	East: 35 West: <25	East: 50 West: <25
Ellis St. / north of E. Middlefield	East: 35 West: <25	East: 45 West: <25
Central Expressway / at Bernardo Ave	North: 100	North: <100

US Highway 101

US Highway is adjacent to the northern boundary of the Plan Area. The primary source of TAC emissions is from diesel trucks that emit DPM. Additional TAC emissions come from gasoline fueled vehicles which emit organic TAC compounds. $PM_{2.5}$, which is also of concern, is emitted from vehicle exhaust, tire and brake wear, and from re-suspended roadway dust. A review of the traffic information reported by Caltrans for 2015 indicates that in the vicinity of the project area, US Highway 101 has an ADT of 182,000[18]. About 2.8 percent of these trips are made by trucks[19].

To assess potential health impacts in the Plan Area from traffic on US Highway 101, a refined analysis was conducted to evaluate potential cancer risks and $PM_{2.5}$ concentrations from traffic. The refined analysis involved developing traffic emissions for the traffic volume and mix of vehicle types on US Highway 101. Then using these emissions as input to an atmospheric dispersion model for roadways, TAC and $PM_{2.5}$ concentrations were calculated throughout the Plan Area. Based on the modeled concentrations, potential exposure to TACs was calculated and associated cancer risks were computed.

Vehicle emissions were calculated using emission factors for traffic on US Highway 101 using CARB's EMFAC2014 model. Default EMFAC2014 vehicle model year distributions for Santa

[18] California Department of Transportation. 2016a. *2015 Traffic Volumes on California State Highways*

[19] California Department of Transportation. 2016b. *2015 Annual Average Daily Truck Traffic on California State Highways*

Clara County were used in calculating emissions for 2020. Average daily traffic volumes and truck percentages were based on Caltrans data for US Highway 101 for 2015. Traffic volumes were assumed to increase 1 percent per year. Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[20] which were then applied to the average daily traffic volumes to obtain estimated hourly traffic volumes and emissions for US Highway 101. The modeling was conducted assuming emissions for the year 2020. Year 2020 emissions were conservatively assumed as being representative of future conditions beyond 2020 since overall vehicle emissions and, in particular, diesel truck emissions will decrease in the future.

For all hours of the day, other than during peak a.m. and p.m. periods, an average speed of 65 mph was assumed for all vehicles other than heavy duty trucks which were assumed to travel at a speed of 60 mph. Based on traffic data from the Santa Clara Valley Transportation Authority's 2014 Monitoring and Conformance Report, traffic speeds during the peak a.m. and p.m. periods were identified.[21] For two hours during the peak a.m. period, an average travel speed of 40 mph was used for north-bound traffic and for two hours during the peak p.m. period, an average travel speed of 25 mph was used for south-bound traffic.

Dispersion modeling of DPM, $PM_{2.5}$, and organic TAC emissions was conducted using the CAL3QHCR model, which is recommended by the BAAQMD for this type of analysis.[22] North- and south-bound traffic on US Highway 101 within about 1,000 feet of the Plan Area was evaluated with the model. A five-year data set of hourly meteorological data (1968 - 1972) from Moffett Field, formatted for use with the CAL3QHCR model by the BAAQMD, was used in the modeling. Other inputs to the model included road geometry, hourly traffic volumes, and emission factors. TAC and $PM_{2.5}$ concentrations were calculated in the Plan Area using a grid of receptors in the Plan Area north of State Route 237. The Plan Area south of State Route 237 is not expected to be significantly affected by vehicle emissions from US Highway 101 due to the distance from the highway. A receptor height of 1.5 meters (about 5 feet) was used for all receptors to represent the breathing heights of potential residents in the Plan Area.

Increased cancer risks were calculated using the modelled maximum annual TAC concentrations, and BAAQMD recommended risk assessment methods.[23] These methods evaluate cancer risk due to a 30-year exposure period and incorporate age sensitivity factors methods for infant (third trimester to two years of age) and children (two years of age to 16 years). The increased cancer risks in the Plan Area from traffic on US Highway 101 were calculated to be greater than the BAAQMD significance threshold of an increased cancer risk of more than 10 in one million for

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[20] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2014 does not include Burden type output with hour by hour traffic volume information.

[21] Santa Clara Valley Transportation Authority. *Santa Clara County Annual Monitoring and Conformance Report 2014.*

[22] BAAQMD, 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May.

[23] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. January.

distances within about 530 feet to 600 feet from US Highway 101. The maximum cancer risk in the Plan Area from US Highway 101 was 40.1 in one million, occurring near the northwest corner of the Plan Area adjacent to US Highway 101. Figure 2 shows the Plan Area and contours lines of maximum increased cancer risk within the Plan Area. The contour line where the cancer risks are at or above the BAAQMD significant impact level of a cancer risk of 10 in one million are highlighted in the figure.

In addition to evaluating the cancer risks from TACs, potential $PM_{2.5}$ impacts from vehicle traffic were evaluated. Annual average $PM_{2.5}$ concentrations were computed at each receptor location. To evaluate potential non-cancer health effects due to $PM_{2.5}$, the BAAQMD adopted a significance threshold of an annual average $PM_{2.5}$ concentration greater than 0.3 $\mu g/m^3$. The maximum $PM_{2.5}$ concentration in the Plan Area from US Highway 101 was 1.6 $\mu g/m^3$, occurring near the northwest corner of the Plan Area adjacent to US Highway 101. Figure 3 shows the Plan Area and contours lines of maximum annual $PM_{2.5}$ concentration. The contour line where the $PM_{2.5}$ concentrations are at the BAAQMD significant impact level of 0.3 $\mu g/m^3$ are highlighted in the figure. For distances within about 680 to 860 feet from US Highway 101 significant $PM_{2.5}$ concentrations would occur.

Figure 2. Increased Cancer Risks in Plan Area from US Highway 101 Traffic

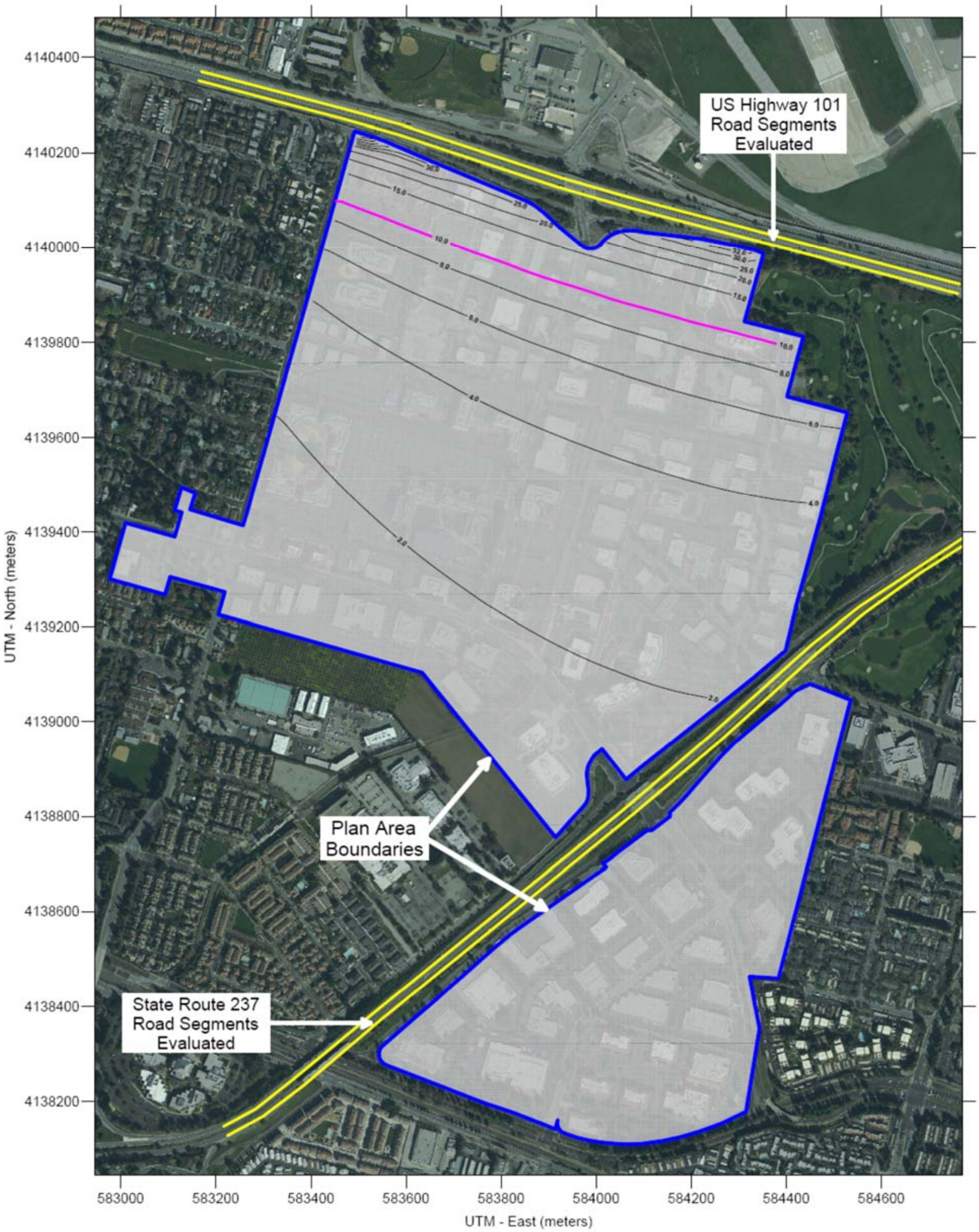
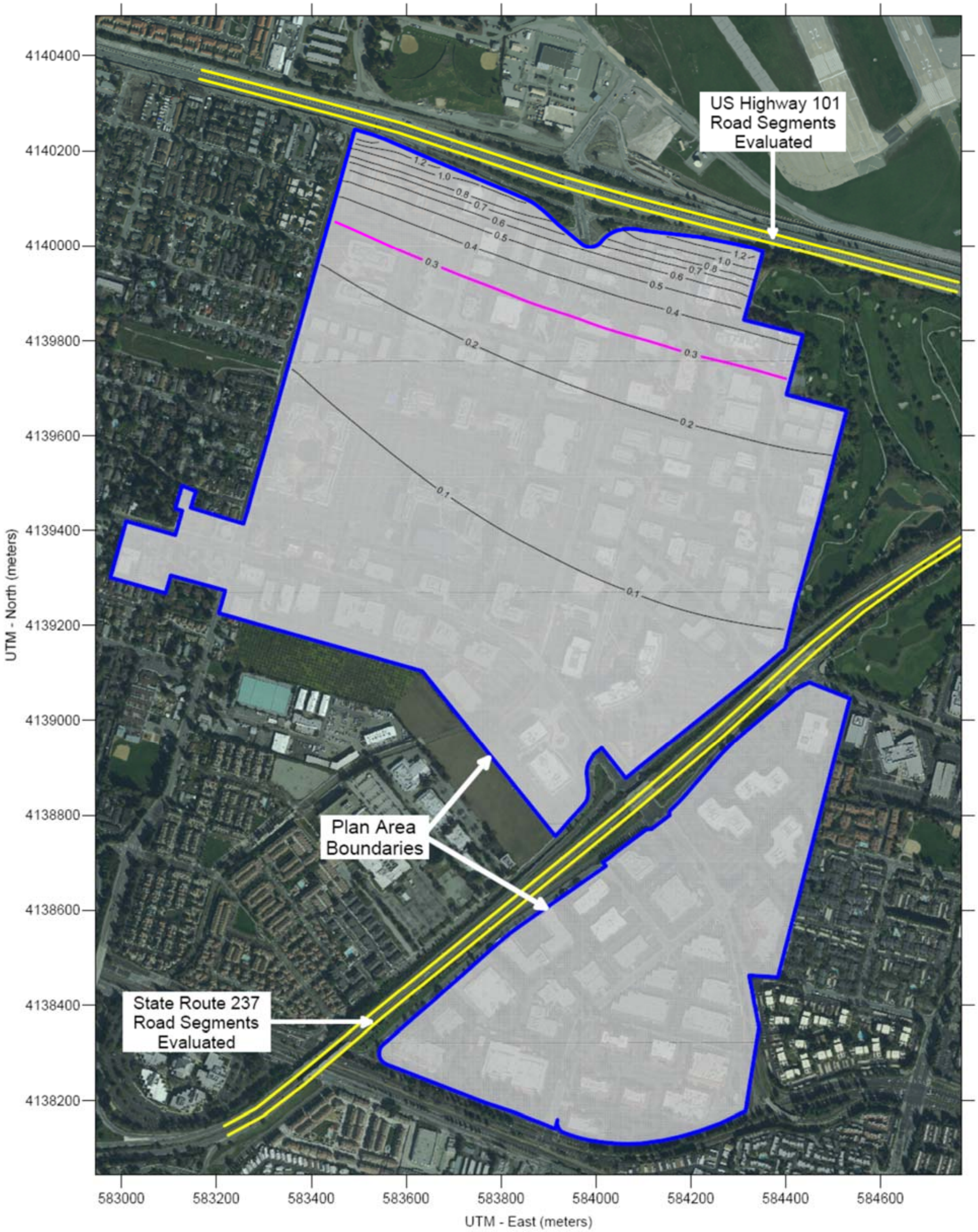


Figure 3. Increased PM2.5 Concentrations from US Highway 101 Traffic



State Route 237

State Route 237 bisects the Plan Area with part of the Plan Area being north of State Route 237 and part of the Plan Area being south of State Route 237. The primary source of TAC emissions is from diesel trucks that emit DPM. Additional TAC emissions come from gasoline fueled vehicles which emit organic TAC compounds. $PM_{2.5}$, which is also of concern, is emitted from vehicle exhaust, tire and brake wear, and from re-suspended roadway dust. A review of the traffic information reported by Caltrans for 2015 indicates that in the vicinity of the project area, State Route 237 has an ADT of 182,000[24]. About 2.6 percent of these trips are made by trucks[25].

To assess potential health impacts in the Plan Area from traffic on State Route 237, a refined analysis was conducted to evaluate potential cancer risks and $PM_{2.5}$ concentrations from traffic. The refined analysis involved developing traffic emissions for the traffic volume and mix of vehicle types on State Route 237. Then using these emissions as input to an atmospheric dispersion model for roadways, TAC and $PM_{2.5}$ concentrations were calculated in the Plan Area in the vicinity of State Route 237. Based on the modeled concentrations, potential exposure to TACs was calculated and associated cancer risks were computed.

Vehicle emissions were calculated using emission factors for traffic on State Route 237 using CARB's EMFAC2014 model. Default EMFAC2014 vehicle model year distributions for Santa Clara County were used in calculating emissions for 2020. Average daily traffic volumes and truck percentages were based on Caltrans data for State Route 237 for 2015. Traffic volumes were assumed to increase 1 percent per year. Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[26] which were then applied to the average daily traffic volumes to obtain estimated hourly traffic volumes and emissions for State Route 237. The modeling was conducted assuming emissions for the year 2020. Year 2020 emissions were conservatively assumed as being representative of future conditions beyond 2020 since overall vehicle emissions and, in particular, diesel truck emissions will decrease in the future.

For all hours of the day, other than during peak a.m. and p.m. periods, an average speed of 55 mph was assumed for all vehicles. Based on traffic data from the Santa Clara Valley Transportation Authority's 2014 Monitoring and Conformance Report, traffic speeds during the peak a.m. and p.m. periods were identified.[27] For two hours during the peak a.m. period, an average travel speed of 50 mph was used for east-bound traffic and for two hours during the peak p.m. period, an average travel speed of 25 mph was used for west-bound traffic.

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[24] California Department of Transportation. 2016a. *2015 Traffic Volumes on California State Highways*

[25] California Department of Transportation. 2016b. *2015 Annual Average Daily Truck Traffic on California State Highways*

[26] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2014 does not include Burden type output with hour by hour traffic volume information.

[27] Santa Clara Valley Transportation Authority. *Santa Clara County Annual Monitoring and Conformance Report 2014.*

Dispersion modeling of DPM, $PM_{2.5}$, and organic TAC emissions was conducted using the CAL3QHCR model, which is recommended by the BAAQMD for this type of analysis.[28] East- and west-bound traffic on State Route 237 within about 1,000 feet of the Plan Area was evaluated with the model. A five-year data set of hourly meteorological data (1968 - 1972) from Moffett Field, formatted for use with the CAL3QHCR model by the BAAQMD, was used in the modeling. Other inputs to the model included road geometry, hourly traffic volumes, and emission factors. TAC and $PM_{2.5}$ concentrations were calculated in the Plan Area using a grid of receptors in the Plan Area north and south of State Route 237. A receptor height of 1.5 meters (about 5 feet) was used for all receptors to represent the breathing heights of potential residents in the Plan Area.

Increased cancer risks were calculated using the modeled maximum annual TAC concentrations, and BAAQMD recommended risk assessment methods.[29] These methods evaluate cancer risk due to a 30-year exposure period and incorporate age sensitivity factors methods for infant (third trimester to two years of age) and children (two years of age to 16 years). The increased cancer risks in the Plan Area from traffic on State Route 237 were calculated to be greater than the BAAQMD significance threshold of an increased cancer risk of more than 10 in one million for distances within about 600 to 650 feet from State Route 237 in the Plan Area south of State Route 237 and at distances from 160 feet to 190 feet from State route 237 in the Plan Area north of State Route 237. The maximum cancer risk in the Plan Area from State Route 237 was 31.5 in one million, occurring adjacent to State Route 237 in the Plan Area south of State Route 237. Figure 3 shows the Plan Area and contours lines of maximum increased cancer risk within the Plan Area from traffic on State Route 237. The contour line where the cancer risks are at or above the BAAQMD significant impact level of a cancer risk of 10 in one million are highlighted in the figure.

In addition to evaluating the cancer risks from TACs, potential $PM_{2.5}$ impacts from vehicle traffic were evaluated. Annual average $PM_{2.5}$ concentrations were computed at each receptor location. To evaluate potential non-cancer health effects due to $PM_{2.5}$, the BAAQMD adopted a significance threshold of an annual average $PM_{2.5}$ concentration greater than 0.3 $\mu g/m^3$. The maximum $PM_{2.5}$ concentration in the Plan Area from State Route 237 was 0.5 $\mu g/m^3$, occurring adjacent to State route 237 in the Plan Area south of State Route 237. Figure 4 shows the Plan Area and contours lines of maximum annual $PM_{2.5}$ concentration. The contour line where the $PM_{2.5}$ concentrations are at the BAAQMD significant impact level of 0.3 $\mu g/m^3$ are highlighted in the figure. Significant $PM_{2.5}$ concentrations would occur at distances within about 280 feet from State Route 237 in the Plan Area south of State Route 237 and would be less than significant at all locations in the Plan Area north of State Route 237.

[28] BAAQMD, 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May.

[29] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. January.

Figure 3. Increased Cancer Risks in Plan Area from State Route 237 Traffic

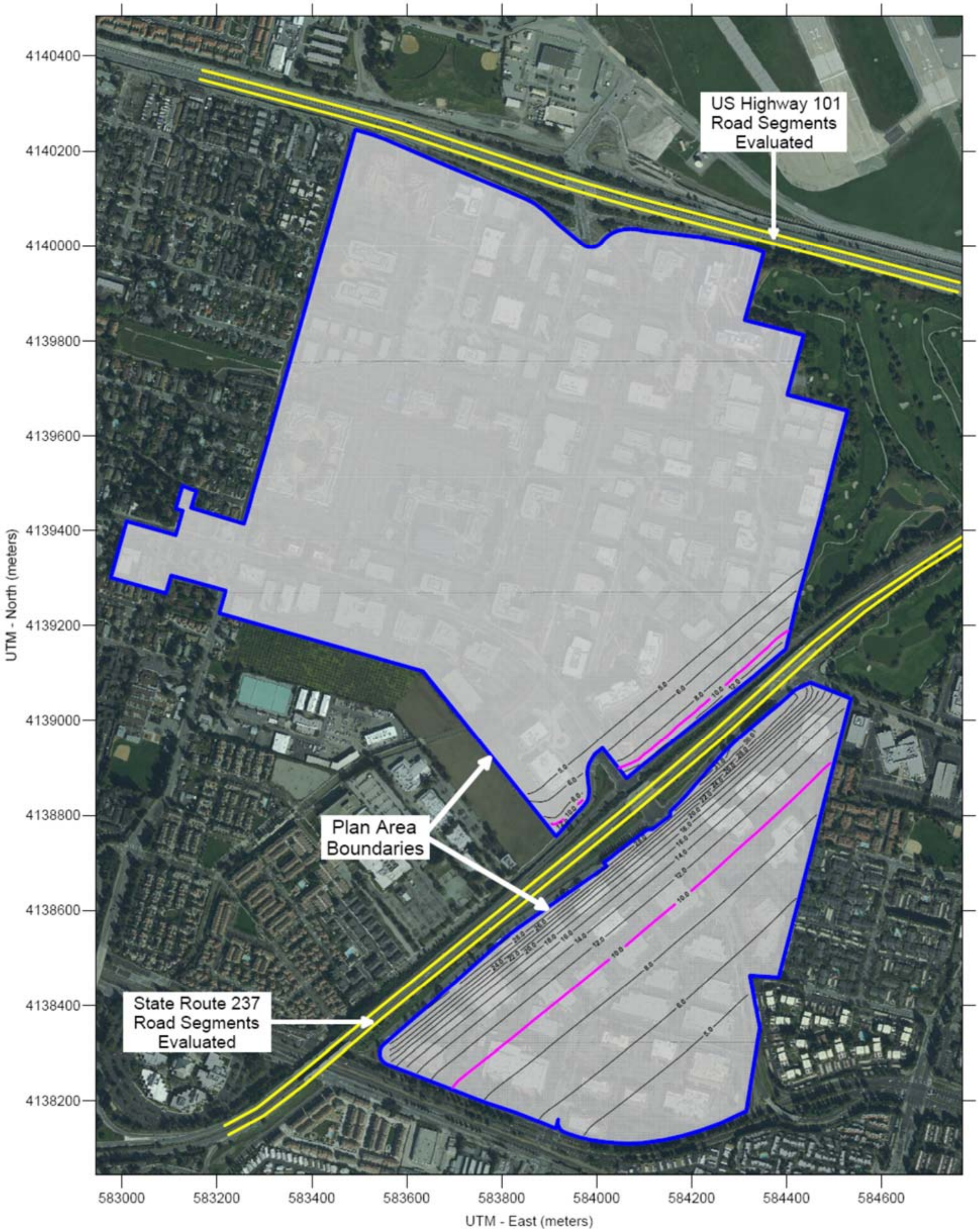
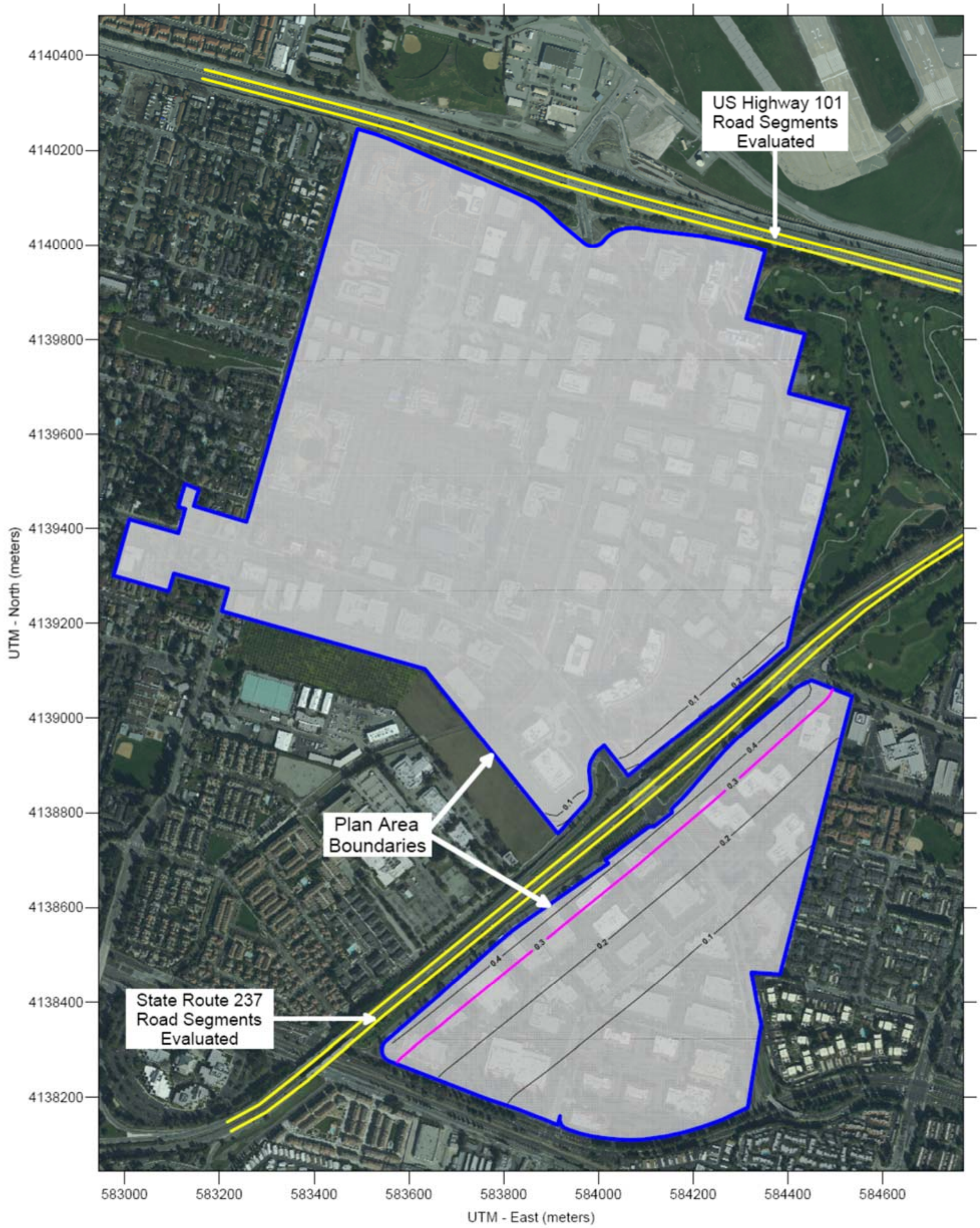


Figure 4. Increased PM2.5 Concentrations from State Route 237 Traffic



Summary of TAC Exposure at EWPP

The assessment of TAC exposures from existing sources within or near the EWPP area show potentially significant TAC exposures. Significant TAC exposure is identified as a source causing lifetime cancer risk that exceeds 10 chances per million or annual PM2.5 concentrations of greater than 0.3μg/m^3. The major sources and extent of their exposures include the following:

1. U.S. Highway 101 – significant TAC exposures extend 900 feet south of the freeway into the EWPP area.
2. State Route 237 – significant TAC exposures extend 700 feet south of the highway and 200 feet north.
3. Central Expressway – significant TAC exposure extends 100 feet north of the roadway.
4. E. Middlefield Road – significant TAC exposures extend up to 75 feet east of the roadway and up to 60 feet north of the roadway. Note that for portions west of State Route 237, significant exposures extend out 35 feet or less.
5. N. Whisman – significant exposures occur at distances of up to 75 feet east of the roadway and less than 25 feet to the west.
6. Stationary Sources – significant TAC exposures vary by sources, ranging from the property boundary to 1,000 feet. See Table 7 for facility specific exposure distances that are based on screening data.

The maximum exposures would occur along U.S. Highway 101 where lifetime cancer risk could reach 32 chances per million and annual PM2.5 concentrations would be 1.3 μg/m^3.

Mitigation Measure AQ-3 The project shall implement appropriate measures to minimize long-term toxic air contaminant (TAC) and annual $PM_{2.5}$ exposure for new project occupants:

Either include measures to reduce long-term exposure to TAC and $PM_{2.5}$, as described below, or conduct site-specific analysis of proposed projects in the EWPP area that are within the identified significant TAC exposure areas. This analysis would identify the project-specific level of exposure to TACs in terms of cancer risk and annual $PM_{2.5}$ concentrations. The analysis shall use procedures prescribed by BAAQMD (e.g., the BAAQMD CEQA Air Quality Guidelines) to predict these exposures. Where cancer risk exceeds 10 chances per million from any single source 100 chances per million from cumulative sources or annual $PM_{2.5}$ concentrations exceed 0.3 μg/m^3 for single sources or 0.8 μg/m^3 for cumulative sources, the following measures shall be implemented:

a. Design project developments to limit exposure from sources of TACs and fine particulate matter ($PM_{2.5}$) emissions. The final site layout shall locate operable windows and air intakes as far as possible from TAC sources. Any modifications to the site design shall incorporate buffers between residences and the roadway.

b. To the greatest degree possible, plant vegetation along the project site boundaries with TAC sources, especially and around outdoor use areas. This barrier would include trees and shrubs that provide a dense vegetative barrier.
c. Install air filtration at residential units or indoor spaces that could include sensitive receptors (e.g., schools or daycare facilities) that have predicted $PM_{2.5}$ concentrations above 0.3 micrograms per cubic meter ($\mu g/m^3$). Air filtration devices shall be rated MERV13 or higher. Alternately, at the approval of the City, equivalent control technology may be used if it is shown by a qualified air quality consultant or heating, ventilation, and air conditioning (HVAC) engineer that it would reduce risk below significance thresholds.
d. As part of implementing this measure, an ongoing maintenance plan for the building's HVAC air filtration system shall be required.
e. Ensure that any lease agreements and other property documents (1) require cleaning, maintenance, and monitoring of the affected units for air flow leaks; (2) include assurance that new owners and tenants are provided information on the ventilation system; and (3) include provisions that fees associated with owning or leasing a unit(s) in the building include funds for cleaning, maintenance, monitoring, and replacements of the filters, as needed.
f. Require that, prior to building occupancy, an authorized air pollutant consultant or HVAC engineer verify the installation of all necessary measures to reduce cancer risk below 10 chances per million from any source and $PM_{2.5}$ concentrations below 0.3 $\mu g/m^3$ for any source and 0.8 $\mu g/m^3$ for all sources.

<u>Effectiveness of Mitigation Measure AQ-3</u>

The BAAQMD CEQA Air Quality Guidelines and BAAQMD's Planning Healthy Places recommend that developments in areas affected by air pollutant sources install and maintain air filtration systems of fresh air supply. These systems should be installed on either an individual unit-by-unit basis, with individual air intake and exhaust ducts ventilating each unit separately, or through a centralized building ventilation system. The ventilation system should be certified to achieve certain effectiveness.

The air filtration recommendations identified for Mitigation Measure AQ-3, filtration system using MERV13, was evaluated for effectiveness. Increased cancer risks for each of the filtration cases were calculated assuming a combination of outdoor and indoor exposure. This includes 3 hours of outdoor exposure to ambient DPM concentrations and 21 hours of indoor exposure to filtered air was assumed. In this case, the effective particulate control efficiency using a MERV13 filtration system is about 85 percent and 70 percent when accounting for 3 hours of non-filtered air. The same type of system with MERV16 filtration would reduce overall exposures by about 80 percent.

Assuming the effectiveness of filtration systems described above and the maximum TAC exposures identified, implementation of Mitigation Measure AQ-3 would reduce maximum cancer risk to about 7 chances per million and cumulative annual $PM_{2.5}$ concentrations to 0.3 µg/m^3 or less. or less. Therefore, with implementation of Mitigation Measure AQ-3, this impact would be reduced to a of less-than-significant level.

Project Construction

Subsequent land use activities associated with implementation of the EWPP could potentially include short-term construction sources of TACs. There are existing sensitive receptors located throughout the EWPP. In addition, projects constructed under the EWPP would place more sensitive receptors in the area. These sensitive receptors could potentially be exposed to construction TACs during construction activity.

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. The construction exhaust emissions may pose community risks for sensitive receptors such as nearby residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. A community risk assessment of the project construction activities would have to be conducted at a project level to address these impacts. Since specific construction plans and schedules for construction are not known, it is not possible to quantify the impacts and determine the significance. There are various measures that can be incorporated into construction plans that could minimize these potential impacts.

Because residential development at the project site would be developed over time there would be on-site residences (new sensitive receptors) occupied while construction would be occurring in other areas of the plan area. Community health risks to nearby off-site and future on-site sensitive receptors associated with temporary construction of the future development is considered *potentially significant. Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce this impact to less than significant.*

Mitigation: Implementation of Mitigation Measures AQ-1 and AQ-2

<u>Effectiveness of Mitigation Measures AQ-1 and AQ-2</u>

Implementation of *Mitigation Measure AQ-1* is considered to reduce exhaust emissions by 5 percent and fugitive dust emissions by over 50 percent. Implementation of the Additional Measures identified in *Mitigation Measure AQ-2* through future project-specific assessments would further reduce on-site diesel exhaust emissions. The selection of appropriate equipment could reduce emissions substantially. For example, the use of diesel-powered construction equipment that meets U.S. EPA particulate matter emissions standards for Tier 4 engines or included diesel particulate matter filters certified by CARB can reduce diesel particulate matter emissions by at least 80 percent over existing emissions rates projected for 2018. That measure alone would likely reduce construction health risk impacts to a less than significant level. Other measures identified in Mitigation Measure AQ-2 would further reduce impacts. Additional measures to reduce TAC and $PM_{2.5}$ emissions would include hourly limits for generator or crane use, electrification or use of alternative fuels for portable equipment, appropriate staging of equipment, and additional limitations on equipment idling. The application of appropriate measures would reduce construction cancer risk below 10 chances per million and the increases to $PM_{2.5}$ concentrations to below 0.3 µg/m^3. Therefore, *after implementation of these recommended measures, the project would have a less-than-significant impact with respect to community risk caused by construction activities.*

Project Operation

Sources of TACs or $PM_{2.5}$ emissions associated with the project have not been identified. The types of land uses envisioned under the EWPP are not anticipated to include these sources such that significant exposures could occur. These uses may include diesel generator or natural gas-fueled boilers that would require permitting by BAAQMD. These types of sources of air pollution that operate within accordance of BAAQMD rules and regulations would not cause significant exposure for on- or off-site sensitive receptors. However, some potential EWPP sources that would not undergo such a review, such as truck loading docks or truck parking areas, transit station enhancements at stations used frequently by diesel-powered buses or trains, may have the potential to cause significant increases in TAC exposure. This would be a potentially *significant* impact.

Mitigation Measure AQ-4 The project shall implement appropriate measures to minimize long-term toxic air contaminant (TAC) and annual $PM_{2.5}$ exposure for new TAC Sources:

Future development in the EWPP that would include TAC sources shall be evaluated through the CEQA process, and if appropriate, the BAAQMD permit process to ensure that they do not cause a significant health risk in terms of excess cancer risk greater than 10 in one million, acute or chronic hazards with a Hazard Index greater than 1.0, or annual PM2.5 exposures greater than 0.3 µg/m^3, or a significant cumulative health risk in terms of excess cancer risk greater than 100 in one million, acute or chronic hazards with a Hazard Index greater than 10.0, or annual PM2.5 exposures greater than 0.8 µg/m^3. These studies would identify the appropriate measures to reduce exposure to TACs to a level of less than significant.

Specific measures that could be applied to future projects that include TAC (or PM2.5) emissions include:

- Use of best available control technology on stationary sources of TAC emissions such as diesel engines that power large emergency generators or pumps and or a limitation on the annual hours that these sources may operate;
- Proper siting of TAC sources to minimize exposures to sensitive receptors;
- Idling restrictions of 2 minutes for active truck loading areas that are near sensitive receptors; and
- Require electric outlets for loading docks and prohibit the use of diesel-powered refrigeration units when trucks are using loading docks near sensitive receptors.

Impact 5: Create objectionable odors affecting a substantial number of people?

Subsequent land use activities associated with implementation of the EWPP could allow for the development of uses that have the potential to produce odorous emissions either during the construction or operation of future development. Additionally, subsequent land use activities may allow for the construction of sensitive land uses (i.e., residential development, schools, parks, offices, etc.) near existing or future sources of odorous emissions. Future construction activities could result in odorous emissions from diesel exhaust associated with construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, exposure of sensitive receptors to these emissions would be limited.

Significant sources of offending odors are typically identified based on complaint histories received and compiled by BAAQMD. It is difficult to identify sources of odors without requesting information by specific facility from BAAQMD. Typical large sources of odors that result in complaints are wastewater treatment facilities, landfills including composting operations, food processing facilities, and chemical plants. Other sources, such as restaurants, paint or body shops, and coffee roasters typically result in localized sources of odors. Table 9 identifies screening buffers included in the BAAQMD CEQA Air Quality Guidelines that could apply to the Plan Area.

According to the BAAQMD CEQA Guidelines, an odor source with five or more confirmed complaints per year averaged over three years is considered to have a significant impact. Future construction activities in the EWPP area could result in odorous emissions from diesel exhaust associated with construction equipment. Because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, exposure of sensitive receptors to these emissions would be limited.

TABLE 9 Odor Screening Distances for the EWPP

Land Use/Type of Operation	Project Screening Distance
Wastewater Treatment Plant	2 miles
Wastewater Pumping Facilities	1 mile
Sanitary Landfill	2 miles
Transfer Station	1 mile
Composting Facility	1 mile
Asphalt Batch Plant	2 miles
Chemical Manufacturing	2 miles
Fiberglass Manufacturing	1 mile
Painting/Coating Operations	1 mile
Coffee Roaster	1 mile
Food Processing Facility	1 mile
Green Waste and Recycling Operations	1 mile

Subsequent land use activities associated with implementation of the EWPP could allow for the development of uses that have the potential to produce odorous emissions either during the construction or operation of future development. Additionally, subsequent land use activities may allow for the construction of sensitive land uses (i.e., residential development, schools, parks, offices, etc.) near existing or future sources of odorous emissions. However, significant sources of odors are not proposed as part of the EWPP. Further, the City would implement General Plan Policy INC 20.8 as part of the development review process to ensure that residents are protected from odors that might be associated with implementation of the EWPP.

Impact 6: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The BAAQMD CEQA Air Quality Guidelines contain methodology and thresholds of significance for evaluating GHG emissions from land use type projects. As discussed above, the City of Mountain View has adopted qualified GHG reduction program (GGRP). This program meets the requirements of a GHG Reduction Strategy under State CEQA Guidelines Section 15183.5. The program includes a goal to improve communitywide emissions efficiency (per-service population – residents and full-time employees) by 30 percent over 2005 levels by 2030. The City intends to achieve GHG reductions from new land use developments to close the gap between projected regional emissions with AB 32 scoping plan measures and the AB 32 targets. The City suggests applying a 2030 GHG efficiency threshold of 4.5 MT per year per service population (S.P.). Projects with emissions above the threshold would be considered to have a cumulatively significant impact.

GHG emissions were computed for the full build-out traffic scenario, with operational emissions in 2030 using the California Emissions Estimator Model Version 2016.3.1 (CalEEMod) and EMFAC2017. EWPP land use types and size were input to CalEEMod. CalEEMod predicts emissions of GHG in the form of equivalent carbon dioxide emissions or CO_2e. Mobile emissions were computed using the VMT data and the CARB EMFAC2017 emissions factor model.

Construction Period Emissions

The BAAQMD does not have an adopted Threshold of Significance for construction-related GHG emissions. BAAQMD encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable, including, but not limited to: using alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment for at least 15 percent of the fleet, using local building materials of at least 10 percent, and recycling or reusing at least 50 percent of construction waste or demolition materials. The EWPP would require that all new construction, additions, and alterations recycle or salvage 65 percent of nonhazardous construction and demolition debris generated at the site.

Operational Period Emissions

The CalEEMod model was used to predict GHG emissions associated with operation of fully developed sites under the EWPP aside from mobile emissions. Daily trip generation rates for each specific land use combined with daily vehicle miles traveled (VMT) data and the CARB EMFAC2017 emissions factor model was used to estimate vehicle emissions associated with operation of the EWPP. Adjustments to the modeling are described below. CalEEMod output worksheets are provided in *Attachment 1*.

Year of Analysis

The Existing Conditions modeling assumed the year 2017 and the future EWPP model run assumed 2030. For comparison to existing conditions, the Existing Conditions were also modeled for 2030.

Mobile Emissions

The traffic study provided VMT data; therefore, mobile emissions were computed with emission rates produced by the CARB EMFAC2017 model. Travel data were combined with vehicle emissions factors. EMFAC2017 produced emissions factors for running exhaust, startup, idle, brake wear and tire wear. Dust entrainment from vehicles was also computed using methods developed by CARB and US EPA that included silt loading factors specific to Santa Clara County. The VMT estimates were assumed to represent weekday conditions and were adjusted for Saturday and Sundays using the default trip rate conversions in CalEEMod.

Electricity Generation

Development under the EWPP is anticipated to occur in 2020 or subsequent years. Therefore, new construction would be subject to new 2019 Title 24 building standards that would greatly increase energy efficiency and require rooftop solar energy production. According to the California Energy Commission, single-family homes built with the 2019 standards are anticipated to use about 7 percent less energy due to energy efficiency measures versus those built under the 2016 standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use about 53 percent less energy than those under the 2016 standards. Nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades[30]. To account for these new standards, an overall improvement of 30 percent in Title 24 energy usage was assumed in CalEEMod.

In 2017, Silicon Valley Clean Energy (SVCE) began providing 100 percent carbon-free electricity to residents and businesses, with over 98-percent participation ion Mountain View. There are essentially no electricity-related emissions. However, a 10-percent non-participation rate was assumed for build-out of the EWPP. For these emissions, PG&E rates were assumed. CalEEMod has a default rate of 641.3 pounds of CO_2 per megawatt of electricity produced, which is based on PG&E's 2008 emissions rate. The rate was adjusted to account for PG&E's projected 2020 CO_2 intensity rate. This 2020 rate is based, in part, on the requirement of a renewable energy portfolio

[30] California CEC. 2018. 2019 Building Energy Efficiency Standards. See: https://www.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf accessed December 13, 2018.

standard of 33 percent by the year 2020. The derived 2020 rate for PG&E was estimated at 290 pounds of CO_2 per megawatt of electricity delivered.[31]

Service Population Rate

The service population rate for this EWPP is the annual GHG emissions expressed in metric tons divided by the estimated number of new residents (population) and employees associated with each of the scenarios evaluated.

GHG Operational Emissions

Table 10 presents the results of the CalEEMod model analysis in terms of annual metric tons of equivalent CO_2e emissions (MT of CO_2e/yr) and service population values. The service population estimates for each scenario are also reported. The CalEEMod modeling data are provided in *Attachment 1*.

As shown in Table 10, 2030 full build-out operation of the EWPP would have annual service population emissions of 2.4 MT of CO_2e/yr/S.P., which would be below the City GGRP threshold of 4.5 MT of CO_2e/year/S.P. This impact is, therefore, considered *less-than significant*.

TABLE 10. 2030 EWPP GHG Emissions (MT of CO_2e)

Source Category	**Existing 2017**	**Existing 2030**	**Existing + EWPP 2030**
Area	72	56	310
Energy Consumption	11,044[a]	9,581 [a]	12,130 [a,b]
Mobile	39,924	34,644	69,858
Solid Waste Generation	1,759	1,759	5,050
Water Usage	5,927	4,094	3,079
Total	**58,726**	**50,134**	**90,427**
Service Population – Residents	2,070	2,070	12,640
Workers	15,630	15,630	24,560
Efficiency Metric	**3.32**	**2.83**	**2.43**
City GGRP 2030 Threshold			**4.5**

[a] Includes adjustment for SVCE carbon-free electricity

[b] Assumes 2019 Title 24 Standards for energy efficiency apply

Notes: GGRP = Greenhouse Gas Reduction Program S.P. = service population

Attachments

[31] Pacific Gas & Electric, 2015. *Greenhouse Gas Emission Factors: Guidance for PG&E Customers*. November.

Attachment 1 to this report includes the operational assumptions and CalEEMod model output files for the EWPP build-out scenarios.

Attachment 2 includes the Health Risk Assessment modeling summaries and screening output.

Attachment 1: CalEEMod Modeling and Assumptions

East Whisman Precise Plan

Emissions Computations using CalEEMod and Emfac2017

		CalEEMod default Trip Rate			Existing			Existing + Project			Cumulative			Cumualtive + Project		
		Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
Condo/Townhouse	Dwelling Unit	5.81	5.67	4.84	6.76	6.60	5.50	5.77	5.63	4.69	6.708	6.55	5.45	5.704	5.57	4.64
General Light Industry	1000sqft	6.97	1.32	0.68	7.01	1.33	0.13	6.76	1.28	0.12						
General Office Building	1000sqft	11.03	2.46	1.05	7.79	1.74	0.17	6.91	1.54	0.15	7.723	1.72	0.16	6.784	1.51	0.14
Hotel	Room	8.17	8.19	5.95	0.00	0.00	0.00	6.92	6.94	5.05	0	0.00	0.00	6.815	6.83	4.98
Quality Restaurant	1000sqft	89.95	94.36	72.16	51.59	54.12	43.42	59.64	62.56	50.19						
Light Indust Research &	1000sqft	8.11	1.9	1.11	7.01	1.64	0.22	6.76	1.58	0.22	6.949	1.63	0.22	6.658	1.56	0.21
Single Family Housing	Dwelling Unit	9.52	9.91	8.62	6.76	7.04	6.37	5.77	6.01	5.44						
Strip Mall	1000sqft	44.32	42.04	20.43	51.59	48.94	22.56	59.64	56.57	26.08	51.148	48.52	22.36	58.747	55.72	25.69

East Whisman Precise Plan

Emissions Computations using CalEEMod and Emfac2017

Existing Conditions in 2017

	CalEEMod Annual VMT	Daily VMT	F&P Daily Trips	F&P Daily VMT	Population	Employment
2017	94440801	258,742	50,860	338,310	2,070	15,630
				6.65	mi/trip	

Emission in Tons per Year	ROG	NOx	CO	PM10	PM2.5	CO2e	
Area	31.7	0.13	9.65	0.44	0.45	72	
Energy	0.84	7.58	6.01	0.58	0.58	11044	
Mobile	14.79	57.94	175.24	19.67	6.02	39924	52201.39
Mobile	7.18	39.05		9.859	3.347	35377	
Waste						1759	
Water						5927	
tons/year -->	47.33	65.65	190.90	20.69	7.05	58,726	3.32
lbs/day -->	**259**	**360**	**1046**	**113**	**39**		

Existing Conditions in 2030

	CalEEMod Annual VMT	Daily VMT	F&P Daily Trips	F&P Daily VMT	Population	Employment
2030	94440801	258,742	50,860	338,310	2,070	15,630
				6.65	mi/trip	

Emission in Tons per Year	ROG	NOx	CO	PM10	PM2.5	CO2e	
Area	31.61	0.115	8.92	0.34	0.34	56	
Energy	0.8402	7.583	6.01	0.58	0.58	9581	
Mobile	6.03	26.06	70.03	19.27	5.65	27893	36470.63
Mobile	7.18	39.05		9.859	3.347	34644	
Waste						1759	
Water						4094	
tons/year -->	39.63	46.75	14.93	10.78	4.27	50,134	2.83
lbs/day -->	**217**	**256**	**82**	**59**	**23**		

Existing + Project Conditions in 2030

	CalEEMod Annual VMT	Daily VMT	F&P Daily Trips	F&P Daily VMT	Population	Employment
2030	190189247	521,066	99,479	668,250	12,640	24,560
				6.72	mi/trip	

with no passby/diverted

	CalEEMod Annual VMT	Daily VMT	F&P Daily Trips	F&P Daily VMT	Population	Employment
	233134870	638,726	99,479	668,250	12,640	24,560
Passby/div effect		23%				

Emission in Tons per Year	ROG	NOx	CO	PM10	PM2.5	CO2e	
Area	53.43	0.71	43.85	0.26	0.26	310	
Energy	1.01	8.94	5.93	0.70	0.70	12130	
Mobile	12.46	53.76	142.45	38.82	11.38	56352	72269.53
Mobile	14.10	76.71		19.418	6.601	69858	
Waste						5050	
Water						3079	
tons/year -->	68.54	86.35	49.78	20.38	7.56	90,427	2.43
lbs/day -->	**376**	**473**	**273**	**112**	**41**		

Cumulative in 2030

	CalEEMod Annual VMT	Daily VMT	F&P Daily Trips	F&P Daily VMT	Population	Employment
2030	108896320	298,346	58,677	403,850	2,190	18,520
				6.88	mi/trip	

Emission in Tons per Year	ROG	NOx	CO	PM10	PM2.5	CO2e	
Area	28.95	0.13	7.84	0.05	0.05	55	
Energy	0.91	8.14	6.46	0.62	0.62	10304	
Mobile	6.95	30.03	80.73	21.51	6.34	32160	43532.72
Mobile	8.38	45.72		11.653	3.977	42187	
Waste						2215	
Water						2987	
tons/year -->	38.24	53.99	14.30	12.32	4.65	57,748	2.79
lbs/day -->	**210**	**296**	**78**	**68**	**25**		

Cumulative + Project in 2030

	CalEEMod Annual VMT	Daily VMT	F&P Daily Trips	F&P Daily VMT	Population	Employment
2030	200695808	549,852	105,199	728,730	12,820	27,360
				6.93	mi/trip	

Emission in Tons per Year	ROG	NOx	CO	PM10	PM2.5	CO2e	
Area	48.20	0.71	43.83	0.26	0.26	312	
Energy	1.30	11.17	7.27	0.87	0.87	13052	
Mobile	11.20	48.09	127.19	33.50	9.87	59451	78791.68
Mobile	15.06	82.20		20.988	7.169	76111	
Waste						5505	
Water						3384	
tons/year -->	64.56	94.08	51.10	22.12	8.30	98,364	2.45
lbs/day -->	**354**	**515**	**280**	**121**	**45**		

Santa Clara
Entrained PM2.5 Road Dust Emission Factors

$E_{2.5}$ = [k(sL)^$^{0.91}$ x (W)^$^{1.02}$ x (1-P/4N) x 453.59

where:

$E_{2.5}$ = $PM_{2.5}$ emission factor (g/VMT)
k = particle size multiplier (g/VMT) [$k_{PM2.5}$ = k_{PM10} x (0.0686/0.4572) = 1.0 x 0.15 = 0.15 g/VMT][a]
sL = roadway specific silt loading (g/m^2)
W = average weight of vehicles on road (Bay Area default = 2.4 tons)[a]
P = number of days with at least 0.01 inch of precipitation in the annual averaging period
N = number of days in the annual averaging period (default = 365)

Notes: [a] CARB 2014, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust (Revised and updated, April 2014)

Road Type	Silt Loading (g/m^2)	Average Weight (tons)	County	No. Days ppt > 0.01"	$PM_{2.5}$ Emission Factor (g/VMT)	PM2.5 Emission Factor (lb/10^6 VMT)
Composite	0.0431	2.4	Santa Clara	0	0.02091	46.1

SFBAAB[a]

Road Type	Silt Loading (g/m^2)
Freeway	0.02
Major	0.032
Collector	0.032
Local	0.32

SFBAAB[a]

County	>0.01 inch precipitation
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

Road Type	Silt Loading (g/m^2)	Fraction of Time on Road Type	Fraction of Total Silt Loading (g/m^2)
Freeway	0.015	0.434	0.0065
Major	0.032	0.449	0.0144
Collector	0.032	0.054	0.0017
Local	0.32	0.064	0.0205
Composite - Total		***1.00***	***0.0431***

OR **PM10 (lb/VMT)** = 0.0022lb/VMT x 0.043$^{0.91}$ x 2.4$^{1.02}$ = 3.1E-04 lbs/mi 0.14

PM2.5 (lb/VMT) = PM10(lb/VMT) x (0.0686/0.4572) = 4.6E-05 lbs/mi 0.02

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: SANTA CLARA
Calendar Year: 2030
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Ye	Vehicle Cate	Model Year	Speed	Fuel	Population	VMT	Trips	VMT %	Trip %	ROG_RUNE	ROG_IDLEX	ROG_STREX	ROG_HOTS
						Total:	51009843	7929092						
SANTA CL/	2030	HHDT	Aggregate	Aggregate	GAS	6.644908	846.0095	132.9513	0.00%	0.00%	0.302922	0	0.001761	0.044849
SANTA CL/	2030	HHDT	Aggregate	Aggregate	DSL	9431.66	1177485	101453.9	2.31%	1.28%	0.022896	4.615071	0	0
SANTA CL/	2030	HHDT	Aggregate	Aggregate	NG	400.4237	16329.01	1561.653	0.03%	0.02%	0.090199	0.028054	0	0
SANTA CL/	2030	LDA	Aggregate	Aggregate	GAS	869969.1	28403709	4092414	55.68%	51.61%	0.003388	0	0.12606	0.065117
SANTA CL/	2030	LDA	Aggregate	Aggregate	DSL	10023.63	337674.2	47693.27	0.66%	0.60%	0.005885	0	0	0
SANTA CL/	2030	LDA	Aggregate	Aggregate	ELEC	46172.96	1625146	221619.4	3.19%	2.80%	0	0	0	0.004888
SANTA CL/	2030	LDT1	Aggregate	Aggregate	GAS	88972.38	2670256	412660.2	5.23%	5.20%	0.00667	0	0.15755	0.095382
SANTA CL/	2030	LDT1	Aggregate	Aggregate	DSL	12.41764	352.1646	54.72798	0.00%	0.00%	0.033785	0	0	0
SANTA CL/	2030	LDT1	Aggregate	Aggregate	ELEC	2180.044	81488.93	10672.84	0.16%	0.13%	0	0	0	0.004888
SANTA CL/	2030	LDT2	Aggregate	Aggregate	GAS	281546.9	8446247	1307139	16.56%	16.49%	0.006634	0	0.189401	0.09208
SANTA CL/	2030	LDT2	Aggregate	Aggregate	DSL	2576.298	81354.46	12261.45	0.16%	0.15%	0.01282	0	0	0
SANTA CL/	2030	LDT2	Aggregate	Aggregate	ELEC	8320.478	213767.2	40645.17	0.42%	0.51%	0	0	0	0.004888
SANTA CL/	2030	LHDT1	Aggregate	Aggregate	GAS	17444.25	563109.1	259893.3	1.10%	3.28%	0.018245	0.350811	0.075233	0.094381
SANTA CL/	2030	LHDT1	Aggregate	Aggregate	DSL	14887.61	510107.2	187267.4	1.00%	2.36%	0.13273	0.10976	0	0
SANTA CL/	2030	LHDT2	Aggregate	Aggregate	GAS	2535.293	81915.35	37772.09	0.16%	0.48%	0.012455	0.344716	0.06918	0.074032
SANTA CL/	2030	LHDT2	Aggregate	Aggregate	DSL	6126.051	201454.9	77058.01	0.39%	0.97%	0.133066	0.10976	0	0
SANTA CL/	2030	MCY	Aggregate	Aggregate	GAS	38839.87	253703.2	77679.74	0.50%	0.98%	2.128511	0	1.877593	0.631299
SANTA CL/	2030	MDV	Aggregate	Aggregate	GAS	173606	5113918	803848	10.03%	10.14%	0.007071	0	0.21174	0.103941
SANTA CL/	2030	MDV	Aggregate	Aggregate	DSL	5652.323	175214.3	26820.46	0.34%	0.34%	0.006382	0	0	0
SANTA CL/	2030	MDV	Aggregate	Aggregate	ELEC	5412.776	143464.5	26723.4	0.28%	0.34%	0	0	0	0.004888
SANTA CL/	2030	MH	Aggregate	Aggregate	GAS	2781.183	26082.35	278.2296	0.05%	0.00%	0.01789	0	0.108156	0.041368
SANTA CL/	2030	MH	Aggregate	Aggregate	DSL	1271.562	11026.54	127.1562	0.02%	0.00%	0.088635	0	0	0
SANTA CL/	2030	MHDT	Aggregate	Aggregate	GAS	1942.274	96462.8	38861.02	0.19%	0.49%	0.018098	1.025296	0.159937	0.053505
SANTA CL/	2030	MHDT	Aggregate	Aggregate	DSL	11245.42	599136.6	111242.1	1.17%	1.40%	0.010837	0.069445	0	0
SANTA CL/	2030	OBUS	Aggregate	Aggregate	GAS	521.2442	22324.56	10429.05	0.04%	0.13%	0.025703	0.748687	0.134449	0.027407
SANTA CL/	2030	OBUS	Aggregate	Aggregate	DSL	845.8557	51263.29	7867.551	0.10%	0.10%	0.012842	0.6229	0	0
SANTA CL/	2030	SBUS	Aggregate	Aggregate	GAS	362.3014	15198.78	1449.205	0.03%	0.02%	0.030067	10.64152	0.317303	0.073145
SANTA CL/	2030	SBUS	Aggregate	Aggregate	DSL	980.5629	30722.11	11315.56	0.06%	0.14%	0.075046	0.264022	0	0
SANTA CL/	2030	UBUS	Aggregate	Aggregate	GAS	8.45001	1063.703	33.80004	0.00%	0.00%	0.022728	0	0.589249	0.05182
SANTA CL/	2030	UBUS	Aggregate	Aggregate	DSL	376.8943	42036.62	1507.577	0.08%	0.02%	0.001107	0	0	0
SANTA CL/	2030	UBUS	Aggregate	Aggregate	NG	152.2876	16985.28	609.1502	0.03%	0.01%	0.091241	0	0	0

Vehicle Cate	Fuel	ROG_RUNL	ROG_RESTL	ROG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNE	NOx_IDLEX	NOx_STREX	CO2_RUNE	CO2_IDLEX	CO2_STREX	CH4_RUNE	CH4_IDLEX
HHDT	GAS	0.220711	0.012382	0.020645	28.21474	0	5.186707	2.895279	0	0.044486	1678	0	40	0.06849	0
HHDT	DSL	0	0	0	0.238872	67.80499	0	2.539781	56.05241	2.353151	1203	10016	0	0.001063	0.214358
HHDT	NG	0	0	0	11.01311	21.88788	0	0.881174	19.09434	0	2900	3654	0	3.225286	1.19295
LDA	GAS	0.180811	0.11416	0.123291	0.43107	0	1.801842	0.020358	0	0.132956	212	0	45	0.001023	0
LDA	DSL	0	0	0	0.146966	0	0	0.01676	0	0	166	0	0	0.000273	0
LDA	ELEC	0	0.00456	0.017501	0	0	0	0	0	0	0	0	0	0	0
LDT1	GAS	0.371981	0.194977	0.219194	0.548445	0	1.868724	0.034308	0	0.154254	249	0	53	0.001722	0
LDT1	DSL	0	0	0	0.286183	0	0	0.189506	0	0	322	0	0	0.001569	0
LDT1	ELEC	0	0.00456	0.017501	0	0	0	0	0	0	0	0	0	0	0
LDT2	GAS	0.348635	0.233116	0.234964	0.568541	0	2.344012	0.035247	0	0.174198	256	0	56	0.00178	0
LDT2	DSL	0	0	0	0.129762	0	0	0.02908	0	0	226	0	0	0.000595	0
LDT2	ELEC	0	0.00456	0.017501	0	0	0	0	0	0	0	0	0	0	0
LHDT1	GAS	0.739315	0.019801	0.035959	0.368714	3.768698	1.531971	0.098098	0.030587	0.387515	898	111	17	0.004317	0.101968
LHDT1	DSL	0	0	0	0.579164	0.909745	0	0.522674	1.343027	0	479	118	0	0.006165	0.005098
LHDT2	GAS	0.436992	0.016932	0.02908	0.249204	3.775612	1.472175	0.091162	0.030032	0.379653	1022	126	20	0.00327	0.10112
LHDT2	DSL	0	0	0	0.586662	0.909745	0	0.503536	1.378592	0	541	191	0	0.006181	0.005098
MCY	GAS	1.487321	0.946881	1.786807	17.60732	0	9.199577	1.137409	0	0.270173	210	0	59	0.319087	0
MDV	GAS	0.361114	0.278651	0.281249	0.571385	0	2.441594	0.03715	0	0.190209	310	0	68	0.001872	0
MDV	DSL	0	0	0	0.160558	0	0	0.016338	0	0	295	0	0	0.000296	0
MDV	ELEC	0	0.00456	0.017501	0	0	0	0	0	0	0	0	0	0	0
MH	GAS	0.780207	0.020421	0.050661	0.321425	0	2.382509	0.161957	0	0.344848	1535	0	23	0.005412	0
MH	DSL	0	0	0	0.288665	0	0	3.194675	0	0	914	0	0	0.004117	0
MHDT	GAS	0.276198	0.013009	0.02236	0.365535	15.26266	3.370143	0.137179	0.089333	0.328382	1513	477	33	0.004329	0.277482
MHDT	DSL	0	0	0	0.11784	2.775159	0	1.636194	4.546441	2.164606	910	787	0	0.000503	0.003226
OBUS	GAS	0.319238	0.017082	0.037276	0.529537	5.789149	2.766701	0.201397	0.065222	0.308429	1543	344	24	0.005871	0.202191
OBUS	DSL	0	0	0	0.14672	10.36618	0	1.991442	9.302951	2.216948	1066	1894	0	0.000596	0.028932
SBUS	GAS	0.474779	0.014584	0.030637	0.649967	82.24088	7.563743	0.285961	0.92653	0.616868	804	2414	45	0.00626	2.435971
SBUS	DSL	0	0	0	0.238791	7.720739	0	4.472027	34.94152	1.257143	1053	3501	0	0.003486	0.012263
UBUS	GAS	0.313542	0.009109	0.015639	0.405122	0	8.852622	0.336697	0	0.964336	1956	0	89	0.006892	0
UBUS	DSL	0	0	0	0.131472	0	0	0.804174	0	0	1523	0	0	0.077448	0
UBUS	NG	0	0	0	49.56612	0	0	0.487691	0	0	2011	0	0	6.385838	0

Vehicle Cate	Fuel	CH4_STREX	PM10_RUN	PM10_IDLE	PM10_STRE	PM10_PMT	PM10_PMB	PM2_5_RUI	PM2_5_IDL	PM2_5_STR	PM2_5_PM	PM2_5_PM	SOx_RUNE	N2O_RUNE	N2O_IDLEX	N2O_STREX
HHDT	GAS	0.000337	0.001179	0	0.00045	0.02	0.06174	0.001084	0	0.000414	0.005	0.02646	0.016601	0.127319	0	0.001575
HHDT	DSL	0	0.024086	0.02277	0	0.035627	0.061101	0.023044	0.021785	0	0.008907	0.026186	0.011364	0.189067	1.574421	0
HHDT	NG	0	0.003619	0.016461	0	0.036	0.06174	0.003462	0.015749	0	0.009	0.02646	0	0.591087	0.744817	0
LDA	GAS	0.030835	0.000956	0	0.001359	0.008	0.03675	0.000879	0	0.001249	0.002	0.01575	0.002095	0.003085	0	0.020493
LDA	DSL	0	0.001912	0	0	0.008	0.03675	0.001829	0	0	0.002	0.01575	0.001571	0.026114	0	0
LDA	ELEC	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0
LDT1	GAS	0.036164	0.001085	0	0.001499	0.008	0.03675	0.000998	0	0.001379	0.002	0.01575	0.002462	0.003879	0	0.021779
LDT1	DSL	0	0.017965	0	0	0.008	0.03675	0.017188	0	0	0.002	0.01575	0.003045	0.050622	0	0
LDT1	ELEC	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0
LDT2	GAS	0.043514	0.001006	0	0.001394	0.008	0.03675	0.000925	0	0.001282	0.002	0.01575	0.002537	0.003847	0	0.023481
LDT2	DSL	0	0.004115	0	0	0.008	0.03675	0.003937	0	0	0.002	0.01575	0.002141	0.035601	0	0
LDT2	ELEC	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0
LHDT1	GAS	0.015524	0.002264	0	0.000362	0.008	0.07644	0.002081	0	0.000333	0.002	0.03276	0.008882	0.006844	0.002802	0.033538
LHDT1	DSL	0	0.012269	0.027477	0	0.012	0.07644	0.011738	0.026289	0	0.003	0.03276	0.004527	0.075273	0.018601	0
LHDT2	GAS	0.014626	0.002148	0	0.000323	0.008	0.08918	0.001975	0	0.000297	0.002	0.03822	0.010112	0.00699	0.00275	0.032936
LHDT2	DSL	0	0.018593	0.028151	0	0.012	0.08918	0.017789	0.026933	0	0.003	0.03822	0.005112	0.084998	0.030082	0
MCY	GAS	0.24786	0.002138	0	0.002862	0.004	0.01176	0.001994	0	0.002676	0.001	0.00504	0.002076	0.065566	0	0.015364
MDV	GAS	0.04685	0.001012	0	0.001433	0.008	0.03675	0.00093	0	0.001318	0.002	0.01575	0.003066	0.004005	0	0.024192
MDV	DSL	0	0.00209	0	0	0.008	0.03675	0.001999	0	0	0.002	0.01575	0.00279	0.04639	0	0
MDV	ELEC	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0
MH	GAS	0.028477	0.001408	0	0.000309	0.012	0.13034	0.001294	0	0.000284	0.003	0.05586	0.015188	0.014768	0	0.039513
MH	DSL	0	0.050662	0	0	0.016	0.13034	0.048471	0	0	0.004	0.05586	0.00864	0.143652	0	0
MHDT	GAS	0.032379	0.001388	0	0.000432	0.012	0.13034	0.001276	0	0.000397	0.003	0.05586	0.014968	0.010371	0.008413	0.029895
MHDT	DSL	0	0.00791	0.002162	0	0.012	0.13034	0.007568	0.002068	0	0.003	0.05586	0.008596	0.14302	0.123631	0
OBUS	GAS	0.026706	0.001295	0	0.000274	0.012	0.13034	0.001191	0	0.000252	0.003	0.05586	0.015267	0.012891	0.005853	0.026143
OBUS	DSL	0	0.01075	0.003081	0	0.012	0.13034	0.010285	0.002947	0	0.003	0.05586	0.010074	0.167606	0.297706	0
SBUS	GAS	0.055823	0.001322	0	0.000595	0.008	0.7448	0.001215	0	0.000547	0.002	0.3192	0.007956	0.018735	0.089714	0.057177
SBUS	DSL	0	0.031102	0.026664	0	0.012	0.7448	0.029756	0.025511	0	0.003	0.3192	0.009947	0.1655	0.550328	0
UBUS	GAS	0.139066	0.002402	0	0.000966	0.012	0.13034	0.002209	0	0.000888	0.003	0.05586	0.019358	0.027885	0	0.079916
UBUS	DSL	0	0.005912	0	0	0.03371	0.068284	0.005656	0	0	0.008428	0.029265	0.0144	0.239436	0	0
UBUS	NG	0	0.003317	0	0	0.03371	0.068284	0.003174	0	0	0.008428	0.029265	0	0.40986	0	0

Calendar	Vehicle Category		ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_RUNLOSS	NOx_RUNEX	NOx_IDLEX	NOx_STREX
		Crr Rate	0.018	0.086	0.148	0.250	0.122	0.891	0.208
			g/mi	g/trip	g/trip	g/trip	g/mi	g/trip	g/trip
2030	HHDT		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	HHDT		0.0005	0.0591	0.0000	0.0000	0.0586	0.7172	0.0301
2030	HHDT		0.0000	0.0000	0.0000	0.0000	0.0003	0.0038	0.0000
2030	LDA		0.0019	0.0000	0.0651	0.0933	0.0113	0.0000	0.0686
2030	LDA		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
2030	LDA		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDT1		0.0003	0.0000	0.0082	0.0194	0.0018	0.0000	0.0080
2030	LDT1		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDT1		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDT2		0.0011	0.0000	0.0312	0.0575	0.0058	0.0000	0.0287
2030	LDT2		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDT2		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LHDT1		0.0002	0.0115	0.0025	0.0242	0.0011	0.0010	0.0127
2030	LHDT1		0.0013	0.0026	0.0000	0.0000	0.0052	0.0317	0.0000
2030	LHDT2		0.0000	0.0016	0.0003	0.0021	0.0001	0.0001	0.0018
2030	LHDT2		0.0005	0.0011	0.0000	0.0000	0.0020	0.0134	0.0000
2030	MCY		0.0106	0.0000	0.0184	0.0146	0.0057	0.0000	0.0026
2030	MDV		0.0007	0.0000	0.0215	0.0366	0.0037	0.0000	0.0193
2030	MDV		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
2030	MDV		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	MH		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
2030	MH		0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
2030	MHDT		0.0000	0.0050	0.0008	0.0014	0.0003	0.0004	0.0016
2030	MHDT		0.0001	0.0010	0.0000	0.0000	0.0192	0.0638	0.0304
2030	OBUS		0.0000	0.0010	0.0002	0.0004	0.0001	0.0001	0.0004
2030	OBUS		0.0000	0.0006	0.0000	0.0000	0.0020	0.0092	0.0022
2030	SBUS		0.0000	0.0019	0.0001	0.0001	0.0001	0.0002	0.0001
2030	SBUS		0.0000	0.0004	0.0000	0.0000	0.0027	0.0499	0.0018
2030	UBUS		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	UBUS		0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
2030	UBUS		0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000

Calendar	Vehicle Category	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
		0.002	0.001	0.001	0.009	0.040	0.002	0.001	0.001	0.002	0.017
		g/mi	g/trip	g/trip	g/mi	g/mi	g/mi	g/trip	g/trip	g/mi	g/mi
2030	HHDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	HHDT	0.0006	0.0003	0.0000	0.0008	0.0014	0.0005	0.0003	0.0000	0.0002	0.0006
2030	HHDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDA	0.0005	0.0000	0.0007	0.0045	0.0205	0.0005	0.0000	0.0006	0.0011	0.0088
2030	LDA	0.0000	0.0000	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000	0.0001
2030	LDA	0.0000	0.0000	0.0000	0.0003	0.0012	0.0000	0.0000	0.0000	0.0001	0.0005
2030	LDT1	0.0001	0.0000	0.0001	0.0004	0.0019	0.0001	0.0000	0.0001	0.0001	0.0008
2030	LDT1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDT1	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDT2	0.0002	0.0000	0.0002	0.0013	0.0061	0.0002	0.0000	0.0002	0.0003	0.0026
2030	LDT2	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
2030	LDT2	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0001
2030	LHDT1	0.0000	0.0000	0.0000	0.0001	0.0008	0.0000	0.0000	0.0000	0.0000	0.0004
2030	LHDT1	0.0001	0.0006	0.0000	0.0001	0.0008	0.0001	0.0006	0.0000	0.0000	0.0003
2030	LHDT2	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
2030	LHDT2	0.0001	0.0003	0.0000	0.0000	0.0004	0.0001	0.0003	0.0000	0.0000	0.0002
2030	MCY	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
2030	MDV	0.0001	0.0000	0.0001	0.0008	0.0037	0.0001	0.0000	0.0001	0.0002	0.0016
2030	MDV	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
2030	MDV	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
2030	MH	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
2030	MH	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	MHDT	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0001
2030	MHDT	0.0001	0.0000	0.0000	0.0001	0.0015	0.0001	0.0000	0.0000	0.0000	0.0007
2030	OBUS	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
2030	OBUS	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001
2030	SBUS	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0001
2030	SBUS	0.0000	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0002
2030	UBUS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2030	UBUS	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
2030	UBUS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Calendar	Vehicle Category	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
			158.9015692							
		274.235		43.483	0.006	0.009	0.033	0.012	0.024	0.020
		g/mi	g/trip	g/trip	g/mi	g/trip	g/trip	g/mi	g/trip	g/trip
2030	HHDT	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	HHDT	27.77	128.16	0.00	0.00	0.00	0.00	0.00	0.02	0.00
2030	HHDT	0.93	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LDA	117.88	0.00	23.20	0.00	0.00	0.02	0.00	0.00	0.01
2030	LDA	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LDA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LDT1	13.02	0.00	2.75	0.00	0.00	0.00	0.00	0.00	0.00
2030	LDT1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LDT1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LDT2	42.45	0.00	9.23	0.00	0.00	0.01	0.00	0.00	0.00
2030	LDT2	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LDT2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LHDT1	9.91	3.62	0.57	0.00	0.00	0.00	0.00	0.00	0.00
2030	LHDT1	4.79	2.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	LHDT2	1.64	0.60	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2030	LHDT2	2.14	1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	MCY	1.04	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00
2030	MDV	31.06	0.00	6.86	0.00	0.00	0.00	0.00	0.00	0.00
2030	MDV	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	MDV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	MH	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	MH	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	MHDT	2.86	2.34	0.16	0.00	0.00	0.00	0.00	0.00	0.00
2030	MHDT	10.69	11.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	OBUS	0.68	0.45	0.03	0.00	0.00	0.00	0.00	0.00	0.00
2030	OBUS	1.07	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	SBUS	0.24	0.44	0.01	0.00	0.00	0.00	0.00	0.00	0.00
2030	SBUS	0.63	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	UBUS	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	UBUS	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	UBUS	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

East Whisman PP - Existing

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	3,042.00	1000sqft	69.83	3,042,000.00	0
Research & Development	2,609.00	1000sqft	59.89	2,609,000.00	0
Hotel	0.00	Room	0.00	0.00	0
Condo/Townhouse	899.00	Dwelling Unit	56.19	899,000.00	2571
Strip Mall	54.00	1000sqft	1.24	54,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2017
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 = 349 for 2017

Land Use - Based on Oct 15, 2018 Trip Gen Memo - Table 4 (use Condo for all Res) Strip Mall for retail + restr

Construction Phase - No construction

Off-road Equipment - No construction

Vehicle Trips - Based on Table 4 derived trip rates

Woodstoves -

Energy Use - Using historical data

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	120.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblRoadDust	RoadSiltLoading	0.1	0.0431
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblVehicleTrips	ST_TR	5.67	6.60
tblVehicleTrips	ST_TR	2.46	1.74
tblVehicleTrips	ST_TR	8.19	0.00
tblVehicleTrips	ST_TR	1.90	1.64
tblVehicleTrips	ST_TR	42.04	48.94
tblVehicleTrips	SU_TR	4.84	5.50
tblVehicleTrips	SU_TR	1.05	0.17
tblVehicleTrips	SU_TR	5.95	0.00
tblVehicleTrips	SU_TR	1.11	0.22
tblVehicleTrips	SU_TR	20.43	22.56
tblVehicleTrips	WD_TR	5.81	6.76
tblVehicleTrips	WD_TR	11.03	7.79
tblVehicleTrips	WD_TR	8.17	0.00
tblVehicleTrips	WD_TR	8.11	7.01
tblVehicleTrips	WD_TR	44.32	51.59

2.0 Emissions Summary

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

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	31.6889	0.1268	9.6521	6.0400e-003		0.4452	0.4452		0.4452	0.4452	40.9852	27.8403	68.8255	0.0771	2.6900e-003	71.5539
Energy	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	35,007.3811	35,007.3811	1.3663	0.4022	35,161.3815
Mobile	14.7944	57.9434	175.2347	0.4375	19.0951	0.5837	19.6789	5.4716	0.5510	6.0226	0.0000	39,881.3067	39,881.3067	1.7111	0.0000	39,924.0842
Waste						0.0000	0.0000		0.0000	0.0000	709.9751	0.0000	709.9751	41.9583	0.0000	1,758.9333
Water						0.0000	0.0000		0.0000	0.0000	598.3627	3,346.4009	3,944.7636	61.6089	1.4825	5,926.7571
Total	**47.3235**	**65.6534**	**190.9010**	**0.4893**	**19.0951**	**1.6094**	**20.7045**	**5.4716**	**1.5766**	**7.0482**	**1,349.3229**	**78,262.9291**	**79,612.2520**	**106.7218**	**1.8873**	**82,842.7099**

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	31.6889	0.1268	9.6521	6.0400e-003		0.4452	0.4452		0.4452	0.4452	40.9852	27.8403	68.8255	0.0771	2.6900e-003	71.5539
Energy	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	35,007.3811	35,007.3811	1.3663	0.4022	35,161.3815
Mobile	14.7944	57.9434	175.2347	0.4375	19.0951	0.5837	19.6789	5.4716	0.5510	6.0226	0.0000	39,881.3067	39,881.3067	1.7111	0.0000	39,924.0842

	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
Waste						0.0000	0.0000		0.0000	0.0000	709.9751	0.0000	709.9751	41.9583	0.0000	1,758.9333
Water						0.0000	0.0000		0.0000	0.0000	598.3627	3,346.4009	3,944.7636	61.6089	1.4825	5,926.7571
Total	**47.3235**	**65.6534**	**190.9010**	**0.4893**	**19.0951**	**1.6094**	**20.7045**	**5.4716**	**1.5766**	**7.0482**	**1,349.3229**	**78,262.9291**	**79,612.2520**	**106.7218**	**1.8873**	**82,842.7099**

	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	14.7944	57.9434	175.2347	0.4375	19.0951	0.5837	19.6789	5.4716	0.5510	6.0226	0.0000	39,881.3067	39,881.3067	1.7111	0.0000	39,924.0842
Unmitigated	14.7944	57.9434	175.2347	0.4375	19.0951	0.5837	19.6789	5.4716	0.5510	6.0226	0.0000	39,881.3067	39,881.3067	1.7111	0.0000	39,924.0842

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	6,077.24	5,933.40	4944.50	13,614,838	13,614,838
General Office Building	23,697.18	5,293.08	517.14	42,433,858	42,433,858
Hotel	0.00	0.00	0.00		
Research & Development	18,289.09	4,278.76	573.98	34,478,155	34,478,155
Strip Mall	2,785.86	2,642.76	1218.24	3,913,950	3,913,950
Total	50,849.37	18,148.00	7,253.86	94,440,801	94,440,801

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
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.591922	0.041427	0.189660	0.112571	0.017564	0.004930	0.012194	0.019187	0.001968	0.001663	0.005432	0.000609	0.000875
General Office Building	0.591922	0.041427	0.189660	0.112571	0.017564	0.004930	0.012194	0.019187	0.001968	0.001663	0.005432	0.000609	0.000875
Hotel	0.591922	0.041427	0.189660	0.112571	0.017564	0.004930	0.012194	0.019187	0.001968	0.001663	0.005432	0.000609	0.000875
Research & Development	0.591922	0.041427	0.189660	0.112571	0.017564	0.004930	0.012194	0.019187	0.001968	0.001663	0.005432	0.000609	0.000875
Strip Mall	0.591922	0.041427	0.189660	0.112571	0.017564	0.004930	0.012194	0.019187	0.001968	0.001663	0.005432	0.000609	0.000875

5.0 Energy Detail

Historical Energy Use: Y

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	26,692.4983	26,692.4983	1.2070	0.2497	26,797.0874

	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
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	26,692.4983	26,692.4983	1.2070	0.2497	26,797.0874
NaturalGas Mitigated	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	8,314.8828	8,314.8828	0.1594	0.1524	8,364.2940
NaturalGas Unmitigated	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	8,314.8828	8,314.8828	0.1594	0.1524	8,364.2940

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					
Condo/Townhouse	1.86258e+007	0.1004	0.8583	0.3652	5.4800e-003		0.0694	0.0694		0.0694	0.0694	0.0000	993.9420	993.9420	0.0191	0.0182	999.8485
General Office Building	6.07183e+007	0.3274	2.9764	2.5002	0.0179		0.2262	0.2262		0.2262	0.2262	0.0000	3,240.1608	3,240.1608	0.0621	0.0594	3,259.4154
Hotel	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	7.63133e+007	0.4115	3.7409	3.1423	0.0225		0.2843	0.2843		0.2843	0.2843	0.0000	4,072.3656	4,072.3656	0.0781	0.0747	4,096.5657
Strip Mall	157680	8.5000e-004	7.7300e-003	6.4900e-003	5.0000e-005		5.9000e-004	5.9000e-004		5.9000e-004	5.9000e-004	0.0000	8.4144	8.4144	1.6000e-004	1.5000e-004	8.4644
Total		**0.8402**	**7.5832**	**6.0142**	**0.0458**		**0.5805**	**0.5805**		**0.5805**	**0.5805**	**0.0000**	**8,314.8828**	**8,314.8828**	**0.1594**	**0.1524**	**8,364.2940**

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					
Condo/Townhouse	1.86258e+007	0.1004	0.8583	0.3652	5.4800e-003		0.0694	0.0694		0.0694	0.0694	0.0000	993.9420	993.9420	0.0191	0.0182	999.8485
General Office Building	6.07183e+007	0.3274	2.9764	2.5002	0.0179		0.2262	0.2262		0.2262	0.2262	0.0000	3,240.1608	3,240.1608	0.0621	0.0594	3,259.4154

Hotel	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	7.63133e+007	0.4115	3.7409	3.1423	0.0225		0.2843	0.2843		0.2843	0.2843	0.0000	4,072.3656	4,072.3656	0.0781	0.0747	4,096.5657
Strip Mall	157680	8.5000e-004	7.7300e-003	6.4900e-003	5.0000e-005		5.9000e-004	5.9000e-004		5.9000e-004	5.9000e-004	0.0000	8.4144	8.4144	1.6000e-004	1.5000e-004	8.4644
Total		**0.8402**	**7.5832**	**6.0142**	**0.0458**		**0.5805**	**0.5805**		**0.5805**	**0.5805**	**0.0000**	**8,314.8828**	**8,314.8828**	**0.1594**	**0.1524**	**8,364.2940**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	3.9164e+006	1,139.3267	0.0515	0.0107	1,143.7909
General Office Building	6.25739e+007	18,203.4767	0.8231	0.1703	18,274.8033
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	2.46029e+007	7,157.2570	0.3236	0.0670	7,185.3013
Strip Mall	661500	192.4379	8.7000e-003	1.8000e-003	193.1920
Total		**26,692.4983**	**1.2070**	**0.2497**	**26,797.0874**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	3.9164e+006	1,139.3267	0.0515	0.0107	1,143.7909

General Office Building	6.25739e+007	18,203.4767	0.8231	0.1703	18,274.8033
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	2.46029e+007	7,157.2570	0.3236	0.0670	7,185.3013
Strip Mall	661500	192.4379	8.7000e-003	1.8000e-003	193.1920
Total		**26,692.4983**	**1.2070**	**0.2497**	**26,797.0874**

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	31.6889	0.1268	9.6521	6.0400e-003		0.4452	0.4452		0.4452	0.4452	40.9852	27.8403	68.8255	0.0771	2.6900e-003	71.5539
Unmitigated	31.6889	0.1268	9.6521	6.0400e-003		0.4452	0.4452		0.4452	0.4452	40.9852	27.8403	68.8255	0.0771	2.6900e-003	71.5539

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	3.6076					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	25.7919					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.0743	0.0477	2.8563	5.6800e-003		0.4084	0.4084		0.4084	0.4084	40.9852	16.8346	57.8197	0.0659	2.6900e-003	60.2674
Landscaping	0.2151	0.0791	6.7958	3.6000e-004		0.0368	0.0368		0.0368	0.0368	0.0000	11.0057	11.0057	0.0112	0.0000	11.2864
Total	**31.6889**	**0.1268**	**9.6521**	**6.0400e-003**		**0.4452**	**0.4452**		**0.4452**	**0.4452**	**40.9852**	**27.8403**	**68.8255**	**0.0771**	**2.6900e-003**	**71.5539**

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	3.6076					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	25.7919					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.0743	0.0477	2.8563	5.6800e-003		0.4084	0.4084		0.4084	0.4084	40.9852	16.8346	57.8197	0.0659	2.6900e-003	60.2674
Landscaping	0.2151	0.0791	6.7958	3.6000e-004		0.0368	0.0368		0.0368	0.0368	0.0000	11.0057	11.0057	0.0112	0.0000	11.2864
Total	**31.6889**	**0.1268**	**9.6521**	**6.0400e-003**		**0.4452**	**0.4452**		**0.4452**	**0.4452**	**40.9852**	**27.8403**	**68.8255**	**0.0771**	**2.6900e-003**	**71.5539**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e

Category	MT/yr			
Mitigated	3,944.7636	61.6089	1.4825	5,926.7571
Unmitigated	3,944.7636	61.6089	1.4825	5,926.7571

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	58.5735 / 36.9268	148.3829	1.9145	0.0463	210.0368
General Office Building	540.666 / 331.376	1,360.0065	17.6714	0.4271	1,929.0686
Hotel	0 / 0	0.0000	0.0000	0.0000	0.0000
Research & Development	1282.83 / 0	2,426.3127	41.8923	1.0059	3,773.3802
Strip Mall	3.99992 / 2.45156	10.0615	0.1307	3.1600e-003	14.2715
Total		**3,944.7636**	**61.6089**	**1.4825**	**5,926.7571**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	58.5735 / 36.9268	148.3829	1.9145	0.0463	210.0368

General Office Building	540.666 / 331.376	1,360.0065	17.6714	0.4271	1,929.068 6
Hotel	0 / 0	0.0000	0.0000	0.0000	0.0000
Research & Development	1282.83 / 0	2,426.3127	41.8923	1.0059	3,773.380 2
Strip Mall	3.99992 / 2.45156	10.0615	0.1307	3.1600e-003	14.2715
Total		**3,944.7636**	**61.6089**	**1.4825**	**5,926.757 1**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	709.9751	41.9583	0.0000	1,758.9333
Unmitigated	709.9751	41.9583	0.0000	1,758.9333

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Condo/Townhouse	413.54	83.9449	4.9610	0.0000	207.9699
General Office Building	2829.06	574.2736	33.9386	0.0000	1,422.738 6
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	198.27	40.2470	2.3785	0.0000	99.7103
Strip Mall	56.7	11.5096	0.6802	0.0000	28.5145
Total		**709.9751**	**41.9583**	**0.0000**	**1,758.933 3**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	413.54	83.9449	4.9610	0.0000	207.9699
General Office Building	2829.06	574.2736	33.9386	0.0000	1,422.738 6
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	198.27	40.2470	2.3785	0.0000	99.7103
Strip Mall	56.7	11.5096	0.6802	0.0000	28.5145
Total		**709.9751**	**41.9583**	**0.0000**	**1,758.933 3**

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

East Whisman PP - Existing

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	3,042.00	1000sqft	69.83	3,042,000.00	0
Research & Development	2,609.00	1000sqft	59.89	2,609,000.00	0
Hotel	0.00	Room	0.00	0.00	0
Condo/Townhouse	899.00	Dwelling Unit	56.19	899,000.00	2571
Strip Mall	54.00	1000sqft	1.24	54,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2030
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 = 290 for 2017

Land Use - Based on Oct 15, 2018 Trip Gen Memo - Table 4 (use Condo for all Res) Strip Mall for retail + restr

Construction Phase - No construction

Off-road Equipment - No construction

Vehicle Trips - Based on Table 4 derived trip rates

Woodstoves - no woodstoves

Energy Use - Using historical data

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblRoadDust	RoadSiltLoading	0.1	0.0431
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblVehicleTrips	ST_TR	5.67	6.60
tblVehicleTrips	ST_TR	2.46	1.74
tblVehicleTrips	ST_TR	8.19	0.00
tblVehicleTrips	ST_TR	1.90	1.64
tblVehicleTrips	ST_TR	42.04	48.94
tblVehicleTrips	SU_TR	4.84	5.50
tblVehicleTrips	SU_TR	1.05	0.17
tblVehicleTrips	SU_TR	5.95	0.00
tblVehicleTrips	SU_TR	1.11	0.22
tblVehicleTrips	SU_TR	20.43	22.56
tblVehicleTrips	WD_TR	5.81	6.76

tblVehicleTrips	WD_TR	11.03	7.79
tblVehicleTrips	WD_TR	8.17	0.00
tblVehicleTrips	WD_TR	8.11	7.01
tblVehicleTrips	WD_TR	44.32	51.59
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

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	31.6071	0.1145	8.9241	3.9500e-003		0.3409	0.3409		0.3409	0.3409	26.9637	27.8403	54.8040	0.0110	2.6900e-003	55.8793
Energy	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	20,384.4619	20,384.4619	1.3663	0.4022	20,538.4622
Mobile	6.0279	26.0616	70.0336	0.3029	19.0706	0.2027	19.2732	5.4591	0.1884	5.6475	0.0000	27,873.4472	27,873.4472	0.7988	0.0000	27,893.4166
Waste						0.0000	0.0000		0.0000	0.0000	709.9751	0.0000	709.9751	41.9583	0.0000	1,758.9333
Water						0.0000	0.0000		0.0000	0.0000	598.3627	1,513.1461	2,111.5088	61.6089	1.4825	4,093.5023
Total	**38.4751**	**33.7592**	**84.9718**	**0.3527**	**19.0706**	**1.1240**	**20.1946**	**5.4591**	**1.1098**	**6.5688**	**1,335.3015**	**49,798.8955**	**51,134.1969**	**105.7433**	**1.8873**	**54,340.1936**

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	31.6071	0.1145	8.9241	3.9500e-003		0.3409	0.3409		0.3409	0.3409	26.9637	27.8403	54.8040	0.0110	2.6900e-003	55.8793
Energy	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	20,384.4619	20,384.4619	1.3663	0.4022	20,538.4622
Mobile	6.0279	26.0616	70.0336	0.3029	19.0706	0.2027	19.2732	5.4591	0.1884	5.6475	0.0000	27,873.4472	27,873.4472	0.7988	0.0000	27,893.4166
Waste						0.0000	0.0000		0.0000	0.0000	709.9751	0.0000	709.9751	41.9583	0.0000	1,758.9333
Water						0.0000	0.0000		0.0000	0.0000	598.3627	1,513.1461	2,111.5088	61.6089	1.4825	4,093.5023
Total	**38.4751**	**33.7592**	**84.9718**	**0.3527**	**19.0706**	**1.1240**	**20.1946**	**5.4591**	**1.1098**	**6.5688**	**1,335.3015**	**49,798.8955**	**51,134.1969**	**105.7433**	**1.8873**	**54,340.1936**

	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	6.0279	26.0616	70.0336	0.3029	19.0706	0.2027	19.2732	5.4591	0.1884	5.6475	0.0000	27,873.4472	27,873.4472	0.7988	0.0000	27,893.4166
Unmitigated	6.0279	26.0616	70.0336	0.3029	19.0706	0.2027	19.2732	5.4591	0.1884	5.6475	0.0000	27,873.4472	27,873.4472	0.7988	0.0000	27,893.4166

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	6,077.24	5,933.40	4944.50	13,614,838	13,614,838
General Office Building	23,697.18	5,293.08	517.14	42,433,858	42,433,858
Hotel	0.00	0.00	0.00		
Research & Development	18,289.09	4,278.76	573.98	34,478,155	34,478,155
Strip Mall	2,785.86	2,642.76	1218.24	3,913,950	3,913,950
Total	50,849.37	18,148.00	7,253.86	94,440,801	94,440,801

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
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
General Office Building	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
Hotel	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
Research & Development	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
Strip Mall	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651

5.0 Energy Detail

Historical Energy Use: Y

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	12,069.5790	12,069.5790	1.2070	0.2497	12,174.1682
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	12,069.5790	12,069.5790	1.2070	0.2497	12,174.1682
NaturalGas Mitigated	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	8,314.8828	8,314.8828	0.1594	0.1524	8,364.2940

	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
NaturalGas Unmitigated	0.8402	7.5832	6.0142	0.0458		0.5805	0.5805		0.5805	0.5805	0.0000	8,314.8828	8,314.8828	0.1594	0.1524	8,364.2940

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					
Condo/Townhouse	1.86258e+007	0.1004	0.8583	0.3652	5.4800e-003		0.0694	0.0694		0.0694	0.0694	0.0000	993.9420	993.9420	0.0191	0.0182	999.8485
General Office Building	6.07183e+007	0.3274	2.9764	2.5002	0.0179		0.2262	0.2262		0.2262	0.2262	0.0000	3,240.1608	3,240.1608	0.0621	0.0594	3,259.4154
Hotel	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	7.63133e+007	0.4115	3.7409	3.1423	0.0225		0.2843	0.2843		0.2843	0.2843	0.0000	4,072.3656	4,072.3656	0.0781	0.0747	4,096.5657
Strip Mall	157680	8.5000e-004	7.7300e-003	6.4900e-003	5.0000e-005		5.9000e-004	5.9000e-004		5.9000e-004	5.9000e-004	0.0000	8.4144	8.4144	1.6000e-004	1.5000e-004	8.4644
Total		**0.8402**	**7.5832**	**6.0142**	**0.0458**		**0.5805**	**0.5805**		**0.5805**	**0.5805**	**0.0000**	**8,314.8828**	**8,314.8828**	**0.1594**	**0.1524**	**8,364.2940**

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					
Condo/Townhouse	1.86258e+007	0.1004	0.8583	0.3652	5.4800e-003		0.0694	0.0694		0.0694	0.0694	0.0000	993.9420	993.9420	0.0191	0.0182	999.8485
General Office Building	6.07183e+007	0.3274	2.9764	2.5002	0.0179		0.2262	0.2262		0.2262	0.2262	0.0000	3,240.1608	3,240.1608	0.0621	0.0594	3,259.4154
Hotel	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Research & Development	7.63133e+007	0.4115	3.7409	3.1423	0.0225		0.2843	0.2843		0.2843	0.2843	0.0000	4,072.3656	4,072.3656	0.0781	0.0747	4,096.5657
Strip Mall	157680	8.5000e-004	7.7300e-003	6.4900e-003	5.0000e-005		5.9000e-004	5.9000e-004		5.9000e-004	5.9000e-004	0.0000	8.4144	8.4144	1.6000e-004	1.5000e-004	8.4644
Total		**0.8402**	**7.5832**	**6.0142**	**0.0458**		**0.5805**	**0.5805**		**0.5805**	**0.5805**	**0.0000**	**8,314.8828**	**8,314.8828**	**0.1594**	**0.1524**	**8,364.2940**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	3.9164e+006	515.1707	0.0515	0.0107	519.6350
General Office Building	6.25739e+007	8,231.0879	0.8231	0.1703	8,302.4145
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	2.46029e+007	3,236.3055	0.3236	0.0670	3,264.3498
Strip Mall	661500	87.0149	8.7000e-003	1.8000e-003	87.7689
Total		**12,069.5790**	**1.2070**	**0.2497**	**12,174.1682**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	3.9164e+006	515.1707	0.0515	0.0107	519.6350
General Office Building	6.25739e+007	8,231.0879	0.8231	0.1703	8,302.4145
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	2.46029e+007	3,236.3055	0.3236	0.0670	3,264.3498
Strip Mall	661500	87.0149	8.7000e-003	1.8000e-003	87.7689
Total		**12,069.5790**	**1.2070**	**0.2497**	**12,174.1682**

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	31.6071	0.1145	8.9241	3.9500e-003		0.3409	0.3409		0.3409	0.3409	26.9637	27.8403	54.8040	0.0110	2.6900e-003	55.8793
Unmitigated	31.6071	0.1145	8.9241	3.9500e-003		0.3409	0.3409		0.3409	0.3409	26.9637	27.8403	54.8040	0.0110	2.6900e-003	55.8793

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	3.6076					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	25.7919					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.0036	0.0373	2.2144	3.5900e-003		0.3036	0.3036		0.3036	0.3036	26.9637	16.8346	43.7983	3.2000e-004	2.6900e-003	44.6073
Landscaping	0.2039	0.0772	6.7097	3.6000e-004		0.0372	0.0372		0.0372	0.0372	0.0000	11.0057	11.0057	0.0107	0.0000	11.2720
Total	**31.6071**	**0.1145**	**8.9241**	**3.9500e-003**		**0.3408**	**0.3408**		**0.3408**	**0.3408**	**26.9637**	**27.8403**	**54.8040**	**0.0110**	**2.6900e-003**	**55.8793**

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	3.6076					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	25.7919					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.0036	0.0373	2.2144	3.5900e-003		0.3036	0.3036		0.3036	0.3036	26.9637	16.8346	43.7983	3.2000e-004	2.6900e-003	44.6073
Landscaping	0.2039	0.0772	6.7097	3.6000e-004		0.0372	0.0372		0.0372	0.0372	0.0000	11.0057	11.0057	0.0107	0.0000	11.2720
Total	**31.6071**	**0.1145**	**8.9241**	**3.9500e-003**		**0.3408**	**0.3408**		**0.3408**	**0.3408**	**26.9637**	**27.8403**	**54.8040**	**0.0110**	**2.6900e-003**	**55.8793**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2,111.5088	61.6089	1.4825	4,093.5023
Unmitigated	2,111.5088	61.6089	1.4825	4,093.5023

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	58.5735 / 36.9268	77.2746	1.9145	0.0463	138.9285
General Office Building	540.666 / 331.376	708.9240	17.6714	0.4271	1,277.9861
Hotel	0 / 0	0.0000	0.0000	0.0000	0.0000
Research & Development	1282.83 / 0	1,320.0655	41.8923	1.0059	2,667.1331
Strip Mall	3.99992 / 2.45156	5.2447	0.1307	3.1600e-003	9.4547
Total		**2,111.5088**	**61.6089**	**1.4825**	**4,093.5023**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	58.5735 / 36.9268	77.2746	1.9145	0.0463	138.9285
General Office Building	540.666 / 331.376	708.9240	17.6714	0.4271	1,277.9861
Hotel	0 / 0	0.0000	0.0000	0.0000	0.0000
Research & Development	1282.83 / 0	1,320.0655	41.8923	1.0059	2,667.1331

Strip Mall	3.99992 / 2.45156	5.2447	0.1307	3.1600e-003	9.4547
Total		**2,111.5088**	**61.6089**	**1.4825**	**4,093.5023**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	709.9751	41.9583	0.0000	1,758.9333
Unmitigated	709.9751	41.9583	0.0000	1,758.9333

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	413.54	83.9449	4.9610	0.0000	207.9699
General Office Building	2829.06	574.2736	33.9386	0.0000	1,422.7386
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	198.27	40.2470	2.3785	0.0000	99.7103
Strip Mall	56.7	11.5096	0.6802	0.0000	28.5145
Total		**709.9751**	**41.9583**	**0.0000**	**1,758.9333**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	413.54	83.9449	4.9610	0.0000	207.9699
General Office Building	2829.06	574.2736	33.9386	0.0000	1,422.7386
Hotel	0	0.0000	0.0000	0.0000	0.0000
Research & Development	198.27	40.2470	2.3785	0.0000	99.7103
Strip Mall	56.7	11.5096	0.6802	0.0000	28.5145
Total		**709.9751**	**41.9583**	**0.0000**	**1,758.9333**

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

East Whisman PP - Existing + Project

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	7,555.00	1000sqft	173.44	7,555,000.00	0
Research & Development	396.00	1000sqft	9.09	396,000.00	0
Hotel	200.00	Room	6.67	290,400.00	0
Condo/Townhouse	5,899.00	Dwelling Unit	368.69	5,899,000.00	16871
Strip Mall	154.00	1000sqft	3.54	154,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2030
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 = 290 for 2017

Land Use - Based on Oct 15, 2018 Trip Gen Memo - Table 4 (use Condo for all Res) Strip Mall for retail + restr

Construction Phase - No construction

Off-road Equipment - No construction

Vehicle Trips - Based on Table 4 derived trip rates

Woodstoves - No wood - 1,888 ng

Consumer Products - 2030 rate will be 78% of 2008 rate = 0.0000167

Energy Use - Using historical data

Water And Wastewater - WTP treatment only

Energy Mitigation - Title 24 standards.

Water Mitigation - water conservation

Table Name	Column Name	Default Value	New Value
tblConsumerProducts	ROG_EF	2.14E-05	1.67E-05
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	884.85	1,888.00
tblFireplaces	NumberNoFireplace	235.96	1,888.00
tblFireplaces	NumberWood	1,002.83	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblRoadDust	RoadSiltLoading	0.1	0
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblVehicleTrips	ST_TR	5.67	5.63
tblVehicleTrips	ST_TR	2.46	1.54
tblVehicleTrips	ST_TR	8.19	6.94
tblVehicleTrips	ST_TR	1.90	1.58
tblVehicleTrips	ST_TR	42.04	56.57
tblVehicleTrips	SU_TR	4.84	4.69
tblVehicleTrips	SU_TR	1.05	0.15
tblVehicleTrips	SU_TR	5.95	5.05
tblVehicleTrips	SU_TR	1.11	0.22
tblVehicleTrips	SU_TR	20.43	26.08
tblVehicleTrips	WD_TR	5.81	5.77
tblVehicleTrips	WD_TR	11.03	6.91
tblVehicleTrips	WD_TR	8.17	6.92

tblVehicleTrips	WD_TR	8.11	6.76
tblVehicleTrips	WD_TR	44.32	59.64
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

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	53.4334	0.7078	43.8475	3.6200e-003		0.2596	0.2596		0.2596	0.2596	0.0000	307.3927	307.3927	0.0731	4.3200e-003	310.5071

Energy	1.3901	12.3125	8.2332	0.0758		0.9604	0.9604		0.9604	0.9604	0.0000	36,329.6692	36,329.6692	2.5209	0.7192	36,607.0233
Mobile	12.4627	53.7644	142.4454	0.6119	10.3403	0.4108	10.7511	4.1050	0.3819	4.4869	0.0000	56,311.6885	56,311.6885	1.6242	0.0000	56,352.2938
Waste						0.0000	0.0000		0.0000	0.0000	2,038.2282	0.0000	2,038.2282	120.4558	0.0000	5,049.6241
Water						0.0000	0.0000		0.0000	0.0000	685.7783	1,873.5754	2,559.3538	2.5477	1.5301	3,079.0191
Total	**67.2862**	**66.7847**	**194.5261**	**0.6914**	**10.3403**	**1.6308**	**11.9711**	**4.1050**	**1.6019**	**5.7069**	**2,724.0065**	**94,822.3259**	**97,546.3324**	**127.2218**	**2.2537**	**101,398.4674**

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	53.4334	0.7078	43.8475	3.6200e-003		0.2596	0.2596		0.2596	0.2596	0.0000	307.3927	307.3927	0.0731	4.3200e-003	310.5071
Energy	1.0104	8.9418	5.9280	0.0551		0.6981	0.6981		0.6981	0.6981	0.0000	30,526.8708	30,526.8708	2.2444	0.6080	30,764.1727
Mobile	12.4627	53.7644	142.4454	0.6119	10.3403	0.4108	10.7511	4.1050	0.3819	4.4869	0.0000	56,311.6885	56,311.6885	1.6242	0.0000	56,352.2938
Waste						0.0000	0.0000		0.0000	0.0000	2,038.2282	0.0000	2,038.2282	120.4558	0.0000	5,049.6241
Water						0.0000	0.0000		0.0000	0.0000	548.6227	1,567.5176	2,116.1403	2.0451	1.2255	2,532.4675
Total	**66.9066**	**63.4141**	**192.2209**	**0.6707**	**10.3403**	**1.3685**	**11.7088**	**4.1050**	**1.3396**	**5.4446**	**2,586.8509**	**88,713.4697**	**91,300.3205**	**126.4426**	**1.8379**	**95,009.0652**

	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	**0.56**	**5.05**	**1.19**	**3.00**	**0.00**	**16.09**	**2.19**	**0.00**	**16.38**	**4.60**	**5.04**	**6.44**	**6.40**	**0.61**	**18.45**	**6.30**

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	12.4627	53.7644	142.4454	0.6119	10.3403	0.4108	10.7511	4.1050	0.3819	4.4869	0.0000	56,311.6885	56,311.6885	1.6242	0.0000	56,352.2938
Unmitigated	12.4627	53.7644	142.4454	0.6119	10.3403	0.4108	10.7511	4.1050	0.3819	4.4869	0.0000	56,311.6885	56,311.6885	1.6242	0.0000	56,352.2938

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	34,037.23	33,211.37	27666.31	76,238,101	76,238,101
General Office Building	52,205.05	11,634.70	1133.25	93,471,153	93,471,153
Hotel	1,384.00	1,388.00	1010.00	2,529,079	2,529,079
Research & Development	2,676.96	625.68	87.12	5,047,439	5,047,439
Strip Mall	9,184.56	8,711.78	4016.32	12,903,475	12,903,475
Total	99,487.80	55,571.53	33,913.00	190,189,247	190,189,247

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
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH

Condo/Townhouse	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
General Office Building	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
Hotel	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
Research & Development	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651
Strip Mall	0.621541	0.034056	0.180136	0.101248	0.011859	0.005060	0.013110	0.022881	0.002221	0.001470	0.005122	0.000646	0.000651

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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	20,527.2062	20,527.2062	2.0527	0.4247	20,705.0850
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	22,572.4010	22,572.4010	2.2572	0.4670	22,768.0025
NaturalGas Mitigated	1.0104	8.9418	5.9280	0.0551		0.6981	0.6981		0.6981	0.6981	0.0000	9,999.6646	9,999.6646	0.1917	0.1833	10,059.0877
NaturalGas Unmitigated	1.3901	12.3125	8.2332	0.0758		0.9604	0.9604		0.9604	0.9604	0.0000	13,757.2682	13,757.2682	0.2637	0.2522	13,839.0208

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					
Condo/Townhouse	1.10447e+008	0.5956	5.0892	2.1656	0.0325		0.4115	0.4115		0.4115	0.4115	0.0000	5,893.8745	5,893.8745	0.1130	0.1081	5,928.8988
General Office Building	1.23675e+008	0.6669	6.0625	5.0925	0.0364		0.4608	0.4608		0.4608	0.4608	0.0000	6,599.7877	6,599.7877	0.1265	0.1210	6,639.0069
Hotel	1.28676e+007	0.0694	0.6308	0.5298	3.7800e-003		0.0479	0.0479		0.0479	0.0479	0.0000	686.6654	686.6654	0.0132	0.0126	690.7459
Research & Development	1.04465e+007	0.0563	0.5121	0.4302	3.0700e-003		0.0389	0.0389		0.0389	0.0389	0.0000	557.4640	557.4640	0.0107	0.0102	560.7767
Strip Mall	364980	1.9700e-003	0.0179	0.0150	1.1000e-004		1.3600e-003	1.3600e-003		1.3600e-003	1.3600e-003	0.0000	19.4767	19.4767	3.7000e-004	3.6000e-004	19.5925
Total		**1.3901**	**12.3125**	**8.2332**	**0.0758**		**0.9604**	**0.9604**		**0.9604**	**0.9604**	**0.0000**	**13,757.2682**	**13,757.2682**	**0.2637**	**0.2522**	**13,839.0208**

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					
Condo/Townhouse	8.28963e+007	0.4470	3.8197	1.6254	0.0244		0.3088	0.3088		0.3088	0.3088	0.0000	4,423.6638	4,423.6638	0.0848	0.0811	4,449.9514
General Office Building	8.67087e+007	0.4676	4.2504	3.5704	0.0255		0.3230	0.3230		0.3230	0.3230	0.0000	4,627.1083	4,627.1083	0.0887	0.0848	4,654.6049
Hotel	9.42116e+006	0.0508	0.4618	0.3879	2.7700e-003		0.0351	0.0351		0.0351	0.0351	0.0000	502.7488	502.7488	9.6400e-003	9.2200e-003	505.7364
Research & Development	8.10493e+006	0.0437	0.3973	0.3337	2.3800e-003		0.0302	0.0302		0.0302	0.0302	0.0000	432.5100	432.5100	8.2900e-003	7.9300e-003	435.0802
Strip Mall	255486	1.3800e-003	0.0125	0.0105	8.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	13.6337	13.6337	2.6000e-004	2.5000e-004	13.7147
Total		**1.0104**	**8.9418**	**5.9280**	**0.0551**		**0.6981**	**0.6981**		**0.6981**	**0.6981**	**0.0000**	**9,999.6647**	**9,999.6647**	**0.1917**	**0.1833**	**10,059.0877**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	2.9763e+007	3,915.0771	0.3915	0.0810	3,949.0033
General Office Building	1.34706e+008	17,719.4220	1.7719	0.3666	17,872.9699
Hotel	2.21285e+006	291.0820	0.0291	6.0200e-003	293.6044
Research & Development	3.27096e+006	430.2679	0.0430	8.9000e-003	433.9964
Strip Mall	1.64626e+006	216.5520	0.0217	4.4800e-003	218.4285
Total		**22,572.4010**	**2.2573**	**0.4670**	**22,768.0025**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	2.85454e+007	3,754.9086	0.3755	0.0777	3,787.4468
General Office Building	1.20857e+008	15,897.7899	1.5898	0.3289	16,035.5524
Hotel	2.03425e+006	267.5891	0.0268	5.5400e-003	269.9079
Research & Development	3.09514e+006	407.1397	0.0407	8.4200e-003	410.6678
Strip Mall	1.51875e+006	199.7788	0.0200	4.1300e-003	201.5100
Total		**20,527.2062**	**2.0527**	**0.4247**	**20,705.0850**

6.0 Area Detail

6.1 Mitigation Measures Area

Category	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
	tons/yr										MT/yr					
Mitigated	53.4334	0.7078	43.8475	3.6200e-003		0.2596	0.2596		0.2596	0.2596	0.0000	307.3927	307.3927	0.0731	4.3200e-003	310.5071
Unmitigated	53.4334	0.7078	43.8475	3.6200e-003		0.2596	0.2596		0.2596	0.2596	0.0000	307.3927	307.3927	0.0731	4.3200e-003	310.5071

6.2 Area by SubCategory

Unmitigated

SubCategory	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
	tons/yr										MT/yr					
Architectural Coating	8.5302					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	43.5658					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0238	0.2035	0.0866	1.3000e-003		0.0165	0.0165		0.0165	0.0165	0.0000	235.6966	235.6966	4.5200e-003	4.3200e-003	237.0972
Landscaping	1.3136	0.5043	43.7609	2.3200e-003		0.2432	0.2432		0.2432	0.2432	0.0000	71.6962	71.6962	0.0686	0.0000	73.4099
Total	**53.4334**	**0.7078**	**43.8475**	**3.6200e-003**		**0.2596**	**0.2596**		**0.2596**	**0.2596**	**0.0000**	**307.3928**	**307.3928**	**0.0731**	**4.3200e-003**	**310.5071**

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	8.5302					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	43.5658					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0238	0.2035	0.0866	1.3000e-003		0.0165	0.0165		0.0165	0.0165	0.0000	235.6966	235.6966	4.5200e-003	4.3200e-003	237.0972
Landscaping	1.3136	0.5043	43.7609	2.3200e-003		0.2432	0.2432		0.2432	0.2432	0.0000	71.6962	71.6962	0.0686	0.0000	73.4099
Total	**53.4334**	**0.7078**	**43.8475**	**3.6200e-003**		**0.2596**	**0.2596**		**0.2596**	**0.2596**	**0.0000**	**307.3928**	**307.3928**	**0.0731**	**4.3200e-003**	**310.5071**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2,116.1403	2.0451	1.2255	2,532.4675
Unmitigated	2,559.3538	2.5477	1.5301	3,079.0191

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	384.344 / 242.304	521.1023	0.5066	0.3037	624.2635
General Office Building	1342.78 / 822.993	1,809.7331	1.7686	1.0608	2,170.0527
Hotel	5.07335 / 0.563706	5.6656	6.5700e-003	3.9800e-003	7.0168
Research & Development	194.711 / 0	207.4788	0.2510	0.1527	259.2512
Strip Mall	11.4072 / 6.99149	15.3740	0.0150	9.0100e-003	18.4350
Total		**2,559.3537**	**2.5477**	**1.5301**	**3,079.0191**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	307.475 / 227.523	432.3881	0.4068	0.2433	515.0514
General Office Building	1074.22 / 772.791	1,500.4540	1.4202	0.8497	1,789.1661
Hotel	4.05868 / 0.52932	4.5685	5.2600e-003	3.1900e-003	5.6498
Research & Development	155.769 / 0	165.9830	0.2008	0.1221	207.4009

Strip Mall	9.12573 / 6.56501	12.7467	0.0121	7.2200e-003	15.1993
Total		**2,116.1402**	**2.0451**	**1.2255**	**2,532.4675**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2,038.2282	120.4558	0.0000	5,049.6241
Unmitigated	2,038.2282	120.4558	0.0000	5,049.6241

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	2713.54	550.8241	32.5528	0.0000	1,364.6434
General Office Building	7026.15	1,426.2450	84.2887	0.0000	3,533.4615
Hotel	109.5	22.2275	1.3136	0.0000	55.0677

Research & Development	30.09	6.1080	0.3610	0.0000	15.1323
Strip Mall	161.7	32.8236	1.9398	0.0000	81.3192
Total		**2,038.2282**	**120.4558**	**0.0000**	**5,049.6241**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	2713.54	550.8241	32.5528	0.0000	1,364.6434
General Office Building	7026.15	1,426.2450	84.2887	0.0000	3,533.4615
Hotel	109.5	22.2275	1.3136	0.0000	55.0677
Research & Development	30.09	6.1080	0.3610	0.0000	15.1323
Strip Mall	161.7	32.8236	1.9398	0.0000	81.3192
Total		**2,038.2282**	**120.4558**	**0.0000**	**5,049.6241**

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

Attachment 2: Community Risk Assessment Information

US Highway 101 Traffic Emissions and Health Risk Calculations

East Whisman Precise Plan
Highway 101
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2020

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB-Hwy101	Northbound Highway 101	NW	4	1657	68	20.6	3.4	3,301	variable
SB-Hwy101	Southbound Highway 101	SE	4	1658	68	20.6	3.4	3,301	variable

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB-Hwy101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.03%	100	0.0397	9	6.84%	226	0.0215	17	6.20%	205	0.0325
2	1.70%	56	0.0350	10	5.79%	191	0.0412	18	4.05%	134	0.0251
3	1.77%	58	0.0325	11	6.82%	225	0.0329	19	3.48%	115	0.0236
4	2.86%	94	0.0423	12	7.29%	241	0.0335	20	2.44%	81	0.0177
5	1.69%	56	0.0396	13	6.72%	222	0.0332	21	2.38%	79	0.0400
6	2.89%	95	0.0431	14	6.67%	220	0.0329	22	3.38%	112	0.0414
7	5.18%	171	0.0428	15	5.90%	195	0.0319	23	1.81%	60	0.0395
8	5.61%	185	0.0207	16	4.83%	159	0.0293	24	0.65%	21	0.0386
								Total		3,301	

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB-Hwy101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.03%	100	0.0397	9	6.84%	226	0.0326	17	6.20%	205	0.0257
2	1.70%	56	0.0350	10	5.79%	191	0.0412	18	4.05%	134	0.0224
3	1.77%	58	0.0325	11	6.82%	225	0.0329	19	3.48%	115	0.0236
4	2.86%	94	0.0423	12	7.29%	241	0.0335	20	2.44%	81	0.0177
5	1.69%	56	0.0396	13	6.72%	222	0.0332	21	2.38%	79	0.0400
6	2.89%	95	0.0431	14	6.67%	220	0.0329	22	3.38%	112	0.0414
7	5.18%	171	0.0428	15	5.90%	195	0.0319	23	1.81%	60	0.0395
8	5.61%	185	0.0313	16	4.83%	159	0.0293	24	0.65%	21	0.0386
								Total		3,301	

East Whisman Precise Plan
Highway 101
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-Hwy101	Northbound Highway 101	NW	4	1657	68	20.6	1.3	95,550	variable
SB-Hwy101	Southbound Highway 101	SE	4	1658	68	20.6	1.3	95,550	variable

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB-Hwy101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	1074	0.0249	9	7.09%	6774	0.0209	17	7.36%	7029	0.0207
2	0.38%	366	0.0273	10	4.33%	4139	0.0230	18	8.22%	7854	0.0202
3	0.32%	302	0.0285	11	4.63%	4420	0.0220	19	5.75%	5493	0.0202
4	0.24%	228	0.0457	12	5.87%	5612	0.0218	20	4.32%	4129	0.0200
5	0.47%	451	0.0265	13	6.17%	5897	0.0212	21	3.28%	3130	0.0208
6	0.87%	834	0.0282	14	6.03%	5765	0.0213	22	3.32%	3168	0.0215
7	3.81%	3641	0.0224	15	7.06%	6742	0.0208	23	2.46%	2354	0.0208
8	7.85%	7502	0.0200	16	7.17%	6855	0.0204	24	1.88%	1792	0.0201
								Total		95,550	

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB-Hwy101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	1074	0.0249	9	7.09%	6774	0.0215	17	7.36%	7029	0.0216
2	0.38%	366	0.0273	10	4.33%	4139	0.0230	18	8.22%	7854	0.0211
3	0.32%	302	0.0285	11	4.63%	4420	0.0220	19	5.75%	5493	0.0202
4	0.24%	228	0.0457	12	5.87%	5612	0.0218	20	4.32%	4129	0.0200
5	0.47%	451	0.0265	13	6.17%	5897	0.0212	21	3.28%	3130	0.0208
6	0.87%	834	0.0282	14	6.03%	5765	0.0213	22	3.32%	3168	0.0215
7	3.81%	3641	0.0224	15	7.06%	6742	0.0208	23	2.46%	2354	0.0208
8	7.85%	7502	0.0204	16	7.17%	6855	0.0204	24	1.88%	1792	0.0201
								Total		95,550	

East Whisman Precise Plan
Highway 101
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-Hwy101	Northbound Highway 101	NW	4	1657	68	20.6	1.3	95,550	variable
SB-Hwy101	Southbound Highway 101	SE	4	1658	68	20.6	1.3	95,550	variable

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB-Hwy101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	1074	0.0100	9	7.09%	6774	0.0100	17	7.36%	7029	0.0100
2	0.38%	366	0.0100	10	4.33%	4139	0.0100	18	8.22%	7854	0.0100
3	0.32%	302	0.0100	11	4.63%	4420	0.0100	19	5.75%	5493	0.0100
4	0.24%	228	0.0100	12	5.87%	5612	0.0100	20	4.32%	4129	0.0100
5	0.47%	451	0.0100	13	6.17%	5897	0.0100	21	3.28%	3130	0.0100
6	0.87%	834	0.0100	14	6.03%	5765	0.0100	22	3.32%	3168	0.0100
7	3.81%	3641	0.0100	15	7.06%	6742	0.0100	23	2.46%	2354	0.0100
8	7.85%	7502	0.0100	16	7.17%	6855	0.0100	24	1.88%	1792	0.0100
								Total		95,550	

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB-Hwy101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	1074	0.0100	9	7.09%	6774	0.0100	17	7.36%	7029	0.0100
2	0.38%	366	0.0100	10	4.33%	4139	0.0100	18	8.22%	7854	0.0100
3	0.32%	302	0.0100	11	4.63%	4420	0.0100	19	5.75%	5493	0.0100
4	0.24%	228	0.0100	12	5.87%	5612	0.0100	20	4.32%	4129	0.0100
5	0.47%	451	0.0100	13	6.17%	5897	0.0100	21	3.28%	3130	0.0100
6	0.87%	834	0.0100	14	6.03%	5765	0.0100	22	3.32%	3168	0.0100
7	3.81%	3641	0.0100	15	7.06%	6742	0.0100	23	2.46%	2354	0.0100
8	7.85%	7502	0.0100	16	7.17%	6855	0.0100	24	1.88%	1792	0.0100
								Total		95,550	

East Whisman Precise Plan
Highway 101 Traffic Data and PM2.5 & TOG Emission Factors - 60 mph Trucks & 65 mph Other Vehicles

Analysis Year = ***2020***

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	**2015 Caltrans Number Vehicles (veh/day)**	**2020 Number Vehicles (veh/day)**	**2020 Percent Diesel**	**Number Diesel Vehicles (veh/day)**	**Vehicle Speed (mph)**	**Vehicles DPM (g/VMT)**	**Total PM2.5 (g/VMT)**	**Exhaust PM2.5 (g/VMT)**	**Exhaust TOG (g/VMT)**	**Running TOG (g/VMT)**
LDA	125,868	132,161	1.06%	1,405	65	0.0101	0.0193	0.0015	0.0158	0.044
LDT	47,797	50,187	0.17%	87	65	0.0143	0.0193	0.0015	0.0243	0.096
MDT	3,297	3,462	9.92%	343	60	0.0130	0.0228	0.0021	0.0449	0.185
HDT	5,038	5,290	90.12%	4,767	60	0.0431	0.0881	0.0382	0.1025	0.110
Total	181,999	191,099	-	6,603	62.5	-	-		-	-
Mix Avg Emission Factor						**0.03410**	**0.02124**	**0.00255**	**0.01886**	**0.06058**
Increase From 2015		1.05								
Vehicles/Direction		95,550		3,301						
Avg Vehicles/Hour/Direction		**3,981**		**138**						

Traffic Data Year = ***2015***

Caltrans 2015 Traffic AADT and Truck AADT perce		Total	Truck by Axle			
	Total	Truck	2	3	4	5
Rte 101, Sunnyvale, Moffett Fiels/Ellis S	182,000	8,336	3,297	703	237	4,099
Rte 101, B Mountain View, Jct Rte. 85			39.55%	8.43%	2.84%	49.17%
	Percent of Total Vehicles	4.58%	1.81%	0.39%	0.13%	2.25%

Traffic Increase per Year (%) = ***1.00%***

East Whisman Precise Plan
Highway 101 Traffic Data and PM2.5 & TOG Emission Factors - 40 mph

Analysis Year = ***2020***

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	**2015 Caltrans Number Vehicles (veh/day)**	**2020 Number Vehicles (veh/day)**	**2020 Percent Diesel**	**Number Diesel Vehicles (veh/day)**	**Vehicle Speed (mph)**	**Vehicles DPM (g/VMT)**	**Total PM2.5 (g/VMT)**	**Exhaust PM2.5 (g/VMT)**	**Exhaust TOG (g/VMT)**	**Running TOG (g/VMT)**
LDA	125,868	132,161	1.06%	1,405	40	0.0092	0.0191	0.0014	0.0146	0.044
LDT	47,797	50,187	0.17%	87	40	0.0125	0.0192	0.0014	0.0228	0.096
MDT	3,297	3,462	9.92%	343	40	0.0143	0.0230	0.0023	0.0462	0.185
HDT	5,038	5,290	90.12%	4,767	40	0.0269	0.0739	0.0240	0.1197	0.110
Total	181,999	191,099	-	6,603	40	-	-		-	-
Mix Avg Emission Factor						**0.02232**	**0.02074**	**0.00204**	**0.01769**	**0.06058**
Increase From 2015		1.05								
Vehicles/Direction		95,550		3,301						
Avg Vehicles/Hour/Direction		**3,981**		**138**						

Traffic Data Year = ***2015***

Caltrans 2015 Traffic AADT and Truck AADT perc		Total*	Truck by Axle			
	Total	Truck	2	3	4	5
Rte 101, Sunnyvale, Moffett Fiels/Ellis S	182,000	8,336	3,297	703	237	4,099
Rte 101, B Mountain View, Jct Rte. 85			39.55%	8.43%	2.84%	49.17%
	Percent of Total Vehicles	4.58%	1.81%	0.39%	0.13%	2.25%

Traffic Increase per Year (%) = ***1.00%***

East Whisman Precise Plan

Highway 101 Traffic Data and PM2.5 & TOG Emission Factors - 25 mph

Analysis Year = ***2020***

Vehicle Type	2015 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Emission Factors: Diesel Vehicles DPM (g/VMT)	All Vehicles: Total PM2.5 (g/VMT)	All Vehicles: Exhaust PM2.5 (g/VMT)	Gas Vehicles: Exhaust TOG (g/VMT)	Gas Vehicles: Running TOG (g/VMT)
LDA	125,868	132,161	1.06%	1,405	25	0.0133	0.0202	0.0025	0.0260	0.044
LDT	47,797	50,187	0.17%	87	25	0.0184	0.0202	0.0025	0.0402	0.096
MDT	3,297	3,462	9.92%	343	25	0.0248	0.0285	0.0078	0.0846	0.185
HDT	5,038	5,290	90.12%	4,767	25	0.0312	0.0772	0.0272	0.2007	0.110
Total	181,999	191,099	-	6,603	25	-	-	-	-	-
Mix Avg Emission Factor						**0.02690**	**0.02195**	**0.00326**	**0.03137**	**0.06058**
Increase From 2015		1.05								
Vehicles/Direction		95,550		3,301						
Avg Vehicles/Hour/Direction		**3,981**		**138**						

Traffic Data Year = ***2015***

Caltrans 2015 Traffic AADT and Truck AADT perc	Total	Total Truck	Truck by Axle: 2	3	4	5
Rte 101, Sunnyvale, Moffett Fiels/Ellis S	182,000	8,336	3,297	703	237	4,099
Rte 101, B Mountain View, Jct Rte. 85			39.55%	8.43%	2.84%	49.17%
Percent of Total Vehicles		4.58%	1.81%	0.39%	0.13%	2.25%

Traffic Increase per Year (%) = ***1.00%***

East Whisman Precise Plan

Highway 101 Traffic Data and Entrained PM2.5 Road Dust Emission Factors

$E_{2.5} = [k(sL)^{0.91} \times (W)^{1.02} \times (1-P/4N) \times 453.59$

where:

$E_{2.5}$ = $PM_{2.5}$ emission factor (g/VMT)

k = particle size multiplier (g/VMT) [$k_{PM2.5} = k_{PM10} \times (0.0686/0.4572) = 1.0 \times 0.15 = 0.15$ g/VMT][a]

sL = roadway specific silt loading (g/m^2)

W = average weight of vehicles on road (Bay Area default = 2.4 tons)[a]

P = number of days with at least 0.01 inch of precipitation in the annual averaging period

N = number of days in the annual averaging period (default = 365)

Notes: [a] CARB 2014, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust (Revised and updated, April 2014)

Road Type	Silt Loading (g/m^2)	Average Weight (tons)	County	No. Days ppt > 0.01"	$PM_{2.5}$ Emission Factor (g/VMT)
Freeway	0.02	2.4	Santa Clara	64	0.00996

SFBAAB[a]

Road Type	Silt Loading (g/m^2)
Collector	0.032
Freeway	0.02
Local	0.32
Major	0.032

SFBAAB[a]

County	>0.01 inch precipitation
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

E Whisman Precise Plan, Highway 101, Mountain View, CA - TACs & PM2.5
CAL3QHCR Risk Modeling Parameters and Maximum Concentrations
On-Site Residential Receptors (1.5 meter receptor heights)

Emissions Year	2020
Receptor Information	
Number of Receptors	1351
Receptor Height =	1.5 meters
Receptor distances =	variable
Meteorological Conditions	
BAAQMD Moffett Field Met Data	1968-1972
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological	Concentration (μg/m^3)		
Data Year	**DPM**	**Exhaust TOG**	**Evaporative TOG**
1968	0.05152	0.93681	3.20257
1969	0.04888	0.87746	2.99968
1970	0.04441	0.82885	2.83351
1971	0.04707	0.85928	2.93753
1972	0.04751	0.85095	2.90907
Maximum	**0.0515**	**0.9368**	**3.2026**
Average	**0.0479**	**0.8707**	**2.9765**

Meteorological	PM2.5 Concentrations (μg/m^3)		
Data Year	**Total PM2.5**	**Road Dust PM2.5**	**Vehicle PM2.5**
1968	1.6013	0.5120	1.08931
1969	1.4996	0.4793	1.02030
1970	1.4174	0.4537	0.96378
1971	1.4689	0.4698	0.99916
1972	1.4541	0.4646	0.98948
Maximum	**1.6013**	**0.5120**	**1.0893**
Average	**1.4883**	**0.4759**	**1.0124**

E Whisman Precise Plan, Highway 101, Mountain View, CA -Maximum Cancer Risks
On-Site Residential Receptors (1.5 meter receptor heights)
30-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

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

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
		Exposure		Age	Annual TAC Conc (ug/m3)						
Exposure		Duration		Sensitivity		Exhaust	Evaporative		Exhaust	Evaporative	
Year	Year	(years)	Age	Factor	DPM	TOG	TOG	DPM	TOG	TOG	Total
0	2020	0.25	-0.25 - 0*	10	0.0479	0.8707	2.9765	0.651	0.068	0.014	0.73
1	2020	1	1	10	0.0479	0.8707	2.9765	7.86	0.817	0.165	8.85
2	2021	1	2	10	0.0479	0.8707	2.9765	7.86	0.817	0.165	8.85
3	2022	1	3	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
4	2023	1	4	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
5	2024	1	5	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
6	2025	1	6	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
7	2026	1	7	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
8	2027	1	8	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
9	2028	1	9	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
10	2029	1	10	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
11	2030	1	11	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
12	2031	1	12	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
13	2032	1	13	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
14	2033	1	14	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
15	2034	1	15	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
16	2035	1	16	3	0.0479	0.8707	2.9765	1.24	0.129	0.026	1.39
17	2036	1	17	1	0.0479	0.8707	2.9765	0.14	0.0143	0.003	0.155
18	2037	1	18	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
19	2038	1	19	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
20	2039	1	20	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
21	2040	1	21	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
22	2041	1	22	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
23	2042	1	23	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
24	2043	1	24	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
25	2044	1	25	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
26	2045	1	26	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
27	2046	1	27	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
28	2047	1	28	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
29	2048	1	29	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
30	2049	1	30	1	0.0479	0.8707	2.9765	0.14	0.014	0.003	0.155
Total Increased Cancer Risk			Total					35.64	3.700	0.746	**40.1**

* Third trimester of pregnancy

State Route 237 Traffic Emissions and Health Risk Calculations

East Whisman Precise Plan
SR-237 (Southbay Freeway)
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2020

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB SR-237	Northbound SR-237	NE	2	1996	44	13.3	3.4	1,098	variable
SB SR-237	Southbound SR-237	SW	2	1992	44	13.3	3.4	1,098	variable

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB SR-237

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.09%	34	0.0262	9	6.85%	75	0.0206	17	6.12%	67	0.0219
2	1.92%	21	0.0233	10	5.72%	63	0.0273	18	4.21%	46	0.0177
3	2.09%	23	0.0220	11	6.81%	75	0.0222	19	3.59%	39	0.0167
4	2.77%	30	0.0281	12	7.26%	80	0.0225	20	2.49%	27	0.0132
5	1.73%	19	0.0262	13	6.64%	73	0.0224	21	2.40%	26	0.0265
6	2.75%	30	0.0286	14	6.62%	73	0.0222	22	3.32%	36	0.0274
7	4.93%	54	0.0285	15	5.83%	64	0.0216	23	1.85%	20	0.0261
8	5.53%	61	0.0198	16	4.83%	53	0.0200	24	0.66%	7	0.0256
								Total		1,098	

2020 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB SR-237

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.09%	34	0.0262	9	6.85%	75	0.0220	17	6.12%	67	0.0255
2	1.92%	21	0.0233	10	5.72%	63	0.0273	18	4.21%	46	0.0223
3	2.09%	23	0.0220	11	6.81%	75	0.0222	19	3.59%	39	0.0167
4	2.77%	30	0.0281	12	7.26%	80	0.0225	20	2.49%	27	0.0132
5	1.73%	19	0.0262	13	6.64%	73	0.0224	21	2.40%	26	0.0265
6	2.75%	30	0.0286	14	6.62%	73	0.0222	22	3.32%	36	0.0274
7	4.93%	54	0.0285	15	5.83%	64	0.0216	23	1.85%	20	0.0261
8	5.53%	61	0.0213	16	4.83%	53	0.0200	24	0.66%	7	0.0256
								Total		1,098	

East Whisman Precise Plan
SR-237 (Southbay Freeway)
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB SR-237	Northbound SR-237	NE	2	1996	44	13.3	1.3	32,550	variable
SB SR-237	Southbound SR-237	SW	2	1992	44	13.3	1.3	32,550	variable

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB SR-237

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	365	0.0235	9	7.09%	2308	0.0208	17	7.37%	2398	0.0202
2	0.39%	125	0.0254	10	4.33%	1409	0.0220	18	8.23%	2678	0.0198
3	0.33%	106	0.0263	11	4.63%	1506	0.0212	19	5.75%	1872	0.0198
4	0.23%	76	0.0400	12	5.87%	1911	0.0211	20	4.32%	1407	0.0196
5	0.47%	154	0.0247	13	6.17%	2008	0.0206	21	3.28%	1066	0.0203
6	0.87%	283	0.0261	14	6.03%	1964	0.0206	22	3.31%	1078	0.0208
7	3.80%	1237	0.0215	15	7.05%	2296	0.0203	23	2.46%	802	0.0203
8	7.85%	2555	0.0199	16	7.18%	2337	0.0200	24	1.88%	611	0.0197
								Total		32,550	

2020 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB SR-237

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	365	0.0235	9	7.09%	2308	0.0208	17	7.37%	2398	0.0216
2	0.39%	125	0.0254	10	4.33%	1409	0.0220	18	8.23%	2678	0.0211
3	0.33%	106	0.0263	11	4.63%	1506	0.0212	19	5.75%	1872	0.0198
4	0.23%	76	0.0400	12	5.87%	1911	0.0211	20	4.32%	1407	0.0196
5	0.47%	154	0.0247	13	6.17%	2008	0.0206	21	3.28%	1066	0.0203
6	0.87%	283	0.0261	14	6.03%	1964	0.0206	22	3.31%	1078	0.0208
7	3.80%	1237	0.0215	15	7.05%	2296	0.0203	23	2.46%	802	0.0203
8	7.85%	2555	0.0199	16	7.18%	2337	0.0200	24	1.88%	611	0.0197
								Total		32,550	

East Whisman Precise Plan
SR-237 (Southbay Freeway)
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2020

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB SR-237	Northbound SR-237	NE	2	1996	44	13.3	1.3	32,550	variable
SB SR-237	Southbound SR-237	SW	2	1992	44	13.3	1.3	32,550	variable

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB SR-237

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	365	0.0100	9	7.09%	2308	0.0100	17	7.37%	2398	0.0100
2	0.39%	125	0.0100	10	4.33%	1409	0.0100	18	8.23%	2678	0.0100
3	0.33%	106	0.0100	11	4.63%	1506	0.0100	19	5.75%	1872	0.0100
4	0.23%	76	0.0100	12	5.87%	1911	0.0100	20	4.32%	1407	0.0100
5	0.47%	154	0.0100	13	6.17%	2008	0.0100	21	3.28%	1066	0.0100
6	0.87%	283	0.0100	14	6.03%	1964	0.0100	22	3.31%	1078	0.0100
7	3.80%	1237	0.0100	15	7.05%	2296	0.0100	23	2.46%	802	0.0100
8	7.85%	2555	0.0100	16	7.18%	2337	0.0100	24	1.88%	611	0.0100
								Total		32,550	

2020 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB SR-237

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.12%	365	0.0100	9	7.09%	2308	0.0100	17	7.37%	2398	0.0100
2	0.39%	125	0.0100	10	4.33%	1409	0.0100	18	8.23%	2678	0.0100
3	0.33%	106	0.0100	11	4.63%	1506	0.0100	19	5.75%	1872	0.0100
4	0.23%	76	0.0100	12	5.87%	1911	0.0100	20	4.32%	1407	0.0100
5	0.47%	154	0.0100	13	6.17%	2008	0.0100	21	3.28%	1066	0.0100
6	0.87%	283	0.0100	14	6.03%	1964	0.0100	22	3.31%	1078	0.0100
7	3.80%	1237	0.0100	15	7.05%	2296	0.0100	23	2.46%	802	0.0100
8	7.85%	2555	0.0100	16	7.18%	2337	0.0100	24	1.88%	611	0.0100
								Total		32,550	

East Whisman Precise Plan
SR-237 (Southbay Freeway) Traffic Data and PM2.5 & TOG Emission Factors - 55 mph

Analysis Year = ***2020***

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	2015 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Vehicles DPM (g/VMT)	Total PM2.5 (g/VMT)	Exhaust PM2.5 (g/VMT)	Exhaust TOG (g/VMT)	Running TOG (g/VMT)
LDA	42,505	44,630	1.06%	474	55	0.0086	0.0190	0.0013	0.0132	0.044
LDT	16,141	16,948	0.17%	30	55	0.0120	0.0190	0.0013	0.0204	0.096
MDT	1,760	1,848	9.92%	183	55	0.0147	0.0235	0.0027	0.0423	0.185
HDT	1,594	1,674	90.12%	1,509	55	0.0286	0.0765	0.0266	0.1230	0.110
Total	62,000	65,100	-	2,196	55	-	-		-	-
Mix Avg Emission Factor						**0.02292**	**0.02062**	**0.00195**	**0.01616**	**0.06179**
Increase From 2015		1.05								
Vehicles/Direction		32,550		1,098						
Avg Vehicles/Hour/Direction		**1,356**		**46**						

Traffic Data Year = ***2015***

Caltrans 2015 Truck AADTs		Total	Truck by Axle			
	Total	Truck	2	3	4	5
Rte 237, A Mountain View, Jct Rte 85	62,000	3,354	1,760	513	21	1,061
			52.48%	15.28%	0.62%	31.63%
Percent of Total Vehicles		5.41%	2.84%	0.83%	0.03%	1.71%

Traffic Increase per Year (%) = ***1.00%***

East Whisman Precise Plan
SR-237 (Southbay Freeway) Traffic Data and PM2.5 & TOG Emission Factors - 50 mph

Analysis Year = ***2020***

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	2015 Caltrans Number Vehicles (veh/day)	2020 Number Vehicles (veh/day)	2020 Percent Diesel	Number Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Vehicles DPM (g/VMT)	Total PM2.5 (g/VMT)	Exhaust PM2.5 (g/VMT)	Exhaust TOG (g/VMT)	Running TOG (g/VMT)
LDA	42,505	44,630	1.06%	474	50	0.0085	0.0190	0.0012	0.0129	0.044
LDT	16,141	16,948	0.17%	30	50	0.0117	0.0190	0.0012	0.0201	0.096
MDT	1,760	1,848	9.92%	183	50	0.0157	0.0252	0.0045	0.0442	0.185
HDT	1,594	1,674	90.12%	1,509	50	0.0263	0.0741	0.0242	0.1114	0.110
Total	62,000	65,100	-	2,196	50	-	-		-	-
Mix Avg Emission Factor						**0.02135**	**0.02058**	**0.00192**	**0.01595**	**0.06179**
Increase From 2015		1.05								
Vehicles/Direction		32,550		1,098						
Avg Vehicles/Hour/Direction		**1,356**		**46**						

Traffic Data Year = ***2015***

Caltrans 2015 Truck AADTs		Total*	Truck by Axle			
	Total	Truck	2	3	4	5
Rte 237, A Mountain View, Jct Rte 85	62,000	3,354	1,760	513	21	1,061
			52.48%	15.28%	0.62%	31.63%
Percent of Total Vehicles		5.41%	2.84%	0.83%	0.03%	1.71%

Traffic Increase per Year (%) = ***1.00%***

East Whisman Precise Plan

SR-237 (Southbay Freeway) Traffic Data and PM2.5 & TOG Emission Factors - 25 mph

Analysis Year = *2020*

						Emission Factors				
	2015 Caltrans	2020		Number		Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	Number Vehicles (veh/day)	Number Vehicles (veh/day)	2020 Percent Diesel	Diesel Vehicles (veh/day)	Vehicle Speed (mph)	Vehicles DPM (g/VMT)	Total PM2.5 (g/VMT)	Exhaust PM2.5 (g/VMT)	Exhaust TOG (g/VMT)	Running TOG (g/VMT)
LDA	42,505	44,630	1.06%	474	25	0.0133	0.0202	0.0025	0.0260	0.044
LDT	16,141	16,948	0.17%	30	25	0.0184	0.0202	0.0025	0.0402	0.096
MDT	1,760	1,848	9.92%	183	25	0.0248	0.0285	0.0078	0.0846	0.185
HDT	1,594	1,674	90.12%	1,509	25	0.0312	0.0772	0.0272	0.2007	0.110
Total	62,000	65,100	-	2,196	25	-	-	-	-	-
Mix Avg Emission Factor						**0.02664**	**0.02193**	**0.00326**	**0.03186**	**0.06179**
Increase From 2015		1.05								
Vehicles/Direction		32,550		1,098						
Avg Vehicles/Hour/Direction		**1,356**		**46**						

Traffic Data Year = *2015*

Caltrans 2015 Truck AADTs		Total	Truck by Axle			
	Total	Truck	2	3	4	5
Rte 237, A Mountain View, Jct Rte 85	62,000	3,354	1,760	513	21	1,061
			52.48%	15.28%	0.62%	31.63%
	Percent of Total Vehicles	5.41%	2.84%	0.83%	0.03%	1.71%

Traffic Increase per Year (%) = *1.00%*

E Whisman Precise Plan, State Route 237, Mountain View, CA - TACs & PM2.5
CAL3QHCR Risk Modeling Parameters and Maximum Concentrations
On-Site Residential Receptors (1.5 meter receptor heights)

Emissions Year	2020
Receptor Information	
Number of Receptors	775
Receptor Height =	1.5 meters
Receptor distances =	variable
Meteorological Conditions	
BAAQMD Moffett Field Met Data	1968-1972
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations

Meteorological	Concentration (μg/m^3)		
Data Year	**DPM**	**Exhaust TOG**	**Evaporative TOG**
1968	0.04401	0.25698	0.91779
1969	0.04042	0.23003	0.82152
1970	0.03673	0.21918	0.78279
1971	0.04141	0.23901	0.85359
1972	0.04113	0.23425	0.83661
Maximum	**0.0440**	**0.2570**	**0.9178**
Average	**0.0407**	**0.2359**	**0.8425**

Meteorological	PM2.5 Concentrations (μg/m^3)		
Data Year	**Total PM2.5**	**Road Dust PM2.5**	**Vehicle PM2.5**
1968	0.4539	0.1479	0.30593
1969	0.4061	0.1322	0.27384
1970	0.3872	0.1263	0.26093
1971	0.4220	0.1375	0.28453
1972	0.4135	0.1346	0.27887
Maximum	**0.4539**	**0.1479**	**0.3059**
Average	**0.4165**	**0.1357**	**0.2808**

E Whisman Precise Plan, State Route 237, Mountain View, CA -Maximum Cancer Risks
On-Site Residential Receptors (1.5 meter receptor heights)
30-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

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

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Year	Exposure Duration (years)	Age	Maximum - Exposure Information: Age Sensitivity Factor	Annual TAC Conc (ug/m3): DPM	Annual TAC Conc (ug/m3): Exhaust TOG	Annual TAC Conc (ug/m3): Evaporative TOG	Cancer Risk (per million): DPM	Cancer Risk (per million): Exhaust TOG	Cancer Risk (per million): Evaporative TOG	Total
0	2020	0.25	-0.25 - 0*	10	0.0407	0.2359	0.8425	0.554	0.018	0.004	0.58
1	2020	1	1	10	0.0407	0.2359	0.8425	6.69	0.221	0.047	6.96
2	2021	1	2	10	0.0407	0.2359	0.8425	6.69	0.221	0.047	6.96
3	2022	1	3	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
4	2023	1	4	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
5	2024	1	5	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
6	2025	1	6	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
7	2026	1	7	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
8	2027	1	8	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
9	2028	1	9	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
10	2029	1	10	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
11	2030	1	11	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
12	2031	1	12	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
13	2032	1	13	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
14	2033	1	14	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
15	2034	1	15	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
16	2035	1	16	3	0.0407	0.2359	0.8425	1.05	0.035	0.007	1.10
17	2036	1	17	1	0.0407	0.2359	0.8425	0.12	0.0039	0.001	0.122
18	2037	1	18	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
19	2038	1	19	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
20	2039	1	20	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
21	2040	1	21	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
22	2041	1	22	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
23	2042	1	23	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
24	2043	1	24	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
25	2044	1	25	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
26	2045	1	26	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
27	2046	1	27	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
28	2047	1	28	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
29	2048	1	29	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
30	2049	1	30	1	0.0407	0.2359	0.8425	0.12	0.004	0.001	0.122
Total Increased Cancer Risk			**Total**					30.32	1.003	0.211	**31.5**

* Third trimester of pregnancy

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	East-West	
Side of the Roadway	North	
Distance from Roadway	100	feet
Annual Average Daily Traffic (ADT)	42,300	

Results

Santa Clara County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.273 ($\mu g/m^3$)

Cancer Risk

13.92 (per million)

Using Central Expressway at Bernardo

Based on N-S (east side)

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

9.57

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

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• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	North-South	
Side of the Roadway	East	
Distance from Roadway	65	feet
Annual Average Daily Traffic (ADT)	24,000	

Results

Santa Clara County

NORTH-SOUTH DIRECTIONAL ROADWAY

PM2.5 annual average

0.295 ($\mu g/m^3$)

Cancer Risk

12.54 (per million)

Using E. Middlefield

Based on E-W (south side)

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

8.62

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	East-West	
Side of the Roadway	South	
Distance from Roadway	25	feet
Annual Average Daily Traffic (ADT)	25,050	

Results

Santa Clara County

EAST-WEST DIRECTIONAL ROADWAY

PM2.5 annual average

0.371 (µg/m^3)

Cancer Risk

14.62 (per million)

Using E. Middlefield

Based on E-W (south side)

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

10.04

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	North-South	
Side of the Roadway	East	
Distance from Roadway	50	feet
Annual Average Daily Traffic (ADT)	18,750	

Results

<u>Santa Clara County</u>

NORTH-SOUTH DIRECTIONAL ROADWAY

PM2.5 annual average

0.282 (µg/m^3)

Cancer Risk

11.97 (per million)

Using Ellis at E Middlefield

Based on N-S (east side)

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

8.22

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

Notes and References:

1. Emissions were developed using EMFAC2011 for fleet mix in 2014 assuming 10,000 AADT and includes impacts from diesel and gasoline vehicle exhaust, brake and tire wear, and resuspended dust.
2. Roadways were modeled using ~~CALINE4~~ Cal3qhcr air dispersion model assuming a source length of one kilometer. Meteorological data used to estimate the screening values are noted at the bottom of the "Results" box.
3. Cancer risks were estimated for 70 year lifetime exposure starting in 2014 that includes sensitivity values for early life exposures and OEHHA toxicity values adopted in 2013.

Bay Area Air Quality Management District

Roadway Screening Analysis Calculator

County specific tables containing estimates of risk and hazard impacts from roadways in the Bay Area.

INSTRUCTIONS:

Input the site-specific characteristics of your project by using the drop down menu in the "Search Parameter" box. We recommend that this analysis be used for roadways with 10,000 AADT and above.

• County: Select the County where the project is located. The calculator is only applicable for projects within the nine Bay Area counties.

• Roadway Direction: Select the orientation that best matches the roadway. If the roadway orientation is neither clearly north-south nor east-west, use the highest values predicted from either orientation.

• Side of the Roadway: Identify on which side of the roadway the project is located.

• Distance from Roadway: Enter the distance in feet from the nearest edge of the roadway to the project site. The calculator estimates values for distances greater than 10 feet and less than 1000 feet. For distances greater than 1000 feet, the user can choose to extrapolate values using a distribution curve or apply 1000 feet values for greater distances.

• Annual Average Daily Traffic (ADT): Enter the annual average daily traffic on the roadway. These data may be collected from the city or the county (if the area is unincorporated).

When the user has completed the data entries, the screening level PM2.5 annual average concentration and the cancer risk results will appear in the Results Box on the right. Please note that the roadway tool is not applicable for California State Highways and the District refers the user to the Highway Screening Analysis Tool at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.

Notes and References listed below the Search Boxes

Search Parameters

County	Santa Clara	
Roadway Direction	North-South	
Side of the Roadway	East	
Distance from Roadway	35	feet
Annual Average Daily Traffic (ADT)	19,200	

Results

Santa Clara County

NORTH-SOUTH DIRECTIONAL ROADWAY

PM2.5 annual average

0.326 ($\mu g/m^3$)

Cancer Risk

13.80 (per million)

Using N Whishman at E Middlefield

Based on N-S (east side)

Data for Santa Clara County based on meteorological data collected from San Jose Airport in 1997

Adjusted for 2015 OEHHA and EMFAC2014 for 2018

9.49

(per million)

Note that EMFAC2014 predicts DSL PM2.5 aggragate rates in 2018 that are 46% of EMFAC2011 for 2014. TOG gasoline rates are 56% of EMFAC2011 year 2014 rates. This is for light- and medium-duty vehciles traveling at 30 mph for Bay Area

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