APPENDIX D
Air Quality

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Air Quality Existing Conditions Report

AIR QUALITY
EXISTING CONDITIONS REPORT
SAN JOSE, CA

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I PURPOSE

This Existing Conditions Report presents a discussion of laws, regulations, policies, and programs related to air quality in the City of San José. This report identifies the existing air quality conditions and environmental constraints in the City of San José for consideration as part of the Envision San José 2040 General Plan Update.

San José generally experiences good to moderate air quality. While San José is a large urban area with abundant emission sources, it does lie downwind of other major urban portions of the San Francisco Bay Area. As a result, emissions from human activities (primarily traffic) within San José and upwind locations (the Peninsula and central Bay Area) contribute to air quality problems experienced in San José and elsewhere in the Bay Area.

The Bay Area Air Quality Management District (BAAQMD), along with other regional planning agencies, relies on local jurisdictions to assist with plans to improve air quality. Many land use and transportation strategies to reduce air quality rely on cities and counties as implementing agencies. Under the California Government Code, air quality is mentioned only as an optional issue in the "Conservation" element. BAAQMD encourages local jurisdictions to include General Plan policies or elements that, when implemented, would improve air quality. Although air quality elements are not mandated, general plans are required to be consistent with any air quality policies and programs that exist within that jurisdiction. Local plans should also be consistent with regional air quality plans, i.e., the Bay Area Clean Air Plan. This background report provides a discussion of current air quality conditions and future planning efforts. Climate and meteorological conditions that affect air quality in the project area are described.

II PHYSICAL ENVIRONMENT

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard. The standards represent the allowable pollutant concentrations designed to ensure that the public health and welfare are protected, while including a reasonable margin of safety to protect the more sensitive individuals in the population.

San José is located in the southern portion of the San Francisco Bay Area Air Basin. The 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 local air quality regulatory agency responsible for this basin is the Bay Area Air Quality Management District (BAAQMD).

Climate and Meteorological Conditions

The climate of San José is characterized by warm dry summers and cool moist winters. The proximity of the San Francisco Bay and Pacific Ocean has a moderating influence on the climate. San José is located at the northern portion of the Santa Clara Valley climate sub region of the Bay Area. The Santa Clara Valley is bounded by mountains to the east and west, and San Francisco Bay to the north.

The major large-scale weather feature controlling the area's climate is a large high pressure system located in the eastern Pacific Ocean, known as the Pacific High. The strength and position of the Pacific High varies seasonally. It is strongest during summer and located off the west coast of the United States. Large-scale atmospheric subsidence associated with the Pacific High produces an elevated temperature inversion along the West Coast. The base of this inversion is usually located from 1,000 to 3,000 feet above sea level, depending on the intensity of subsidence and the prevailing weather condition. Vertical mixing is often limited to the base of the inversion, trapping air pollutants in the lower atmosphere. Marine air trapped below the base of the inversion is often condensed into fog or stratus clouds by the cool Pacific Ocean. This condition is typical of the warmer months of the year from roughly May through October. Stratus-type clouds usually form offshore and move into the Bay Area during the evening hours. Stratus also forms over the San Francisco Bay during the evening hours. Typically, stratus covers the Peninsula and moves into the Santa Clara Valley during late night and early morning hours. As the land warms the following morning, the clouds often dissipate. The stratus then redevelops and moves inland late in the day along with an increase in winds. Otherwise, clear skies and dry conditions prevail during summer.

As winter approaches, the Pacific High becomes weaker and shifts south, allowing weather systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. The number of days with precipitation can vary greatly from year to year, resulting in a wide range of annual precipitation totals. Precipitation is generally lowest along the Bay and the Santa Clara Valley with much higher amounts occurring along south and west facing mountain slopes that to the west. Santa Clara, which lies on the lee side of the Santa Cruz Mountains, receives about 15 inches of precipitation. Mountains to the west receive about 40 inches. Most of rainfall occurs from November through April. High-pressure systems are also common in winter with low-level inversions that trap produce cool stagnant conditions. Radiation fog and haze trapped near the surface are common during extended winter periods where high-pressure systems influence the weather

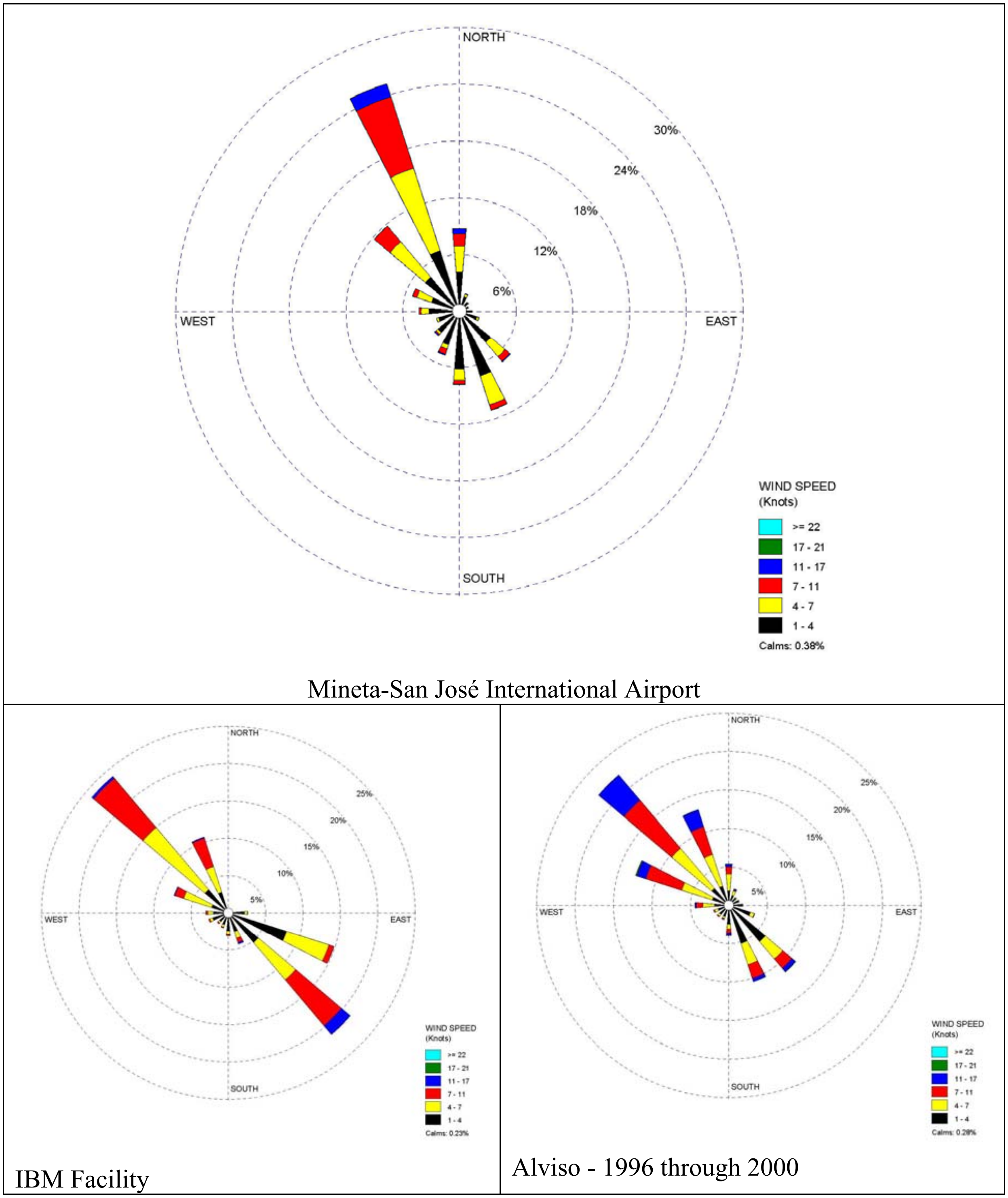
The direction of wind flow in Santa Clara Valley is influenced primarily by terrain, resulting in prevailing wind flows along the valley’s northwest-southeast axis. The proximity of the eastern Pacific High and relatively lower pressure inland produces a prevailing westerly sea breeze along the central and northern California coast for most of the year. As this wind is channeled through the Golden Gate and other topographical gaps to the west, it branches off to the northeast and southeast, following the general orientation of the San Francisco Bay system. Marine air penetrates the eastern Peninsula mainly from the northwest and through gaps in the lower mountains. The prevailing wind in most of San José is primarily from a northwest direction, especially during spring and summer (see Figure 1). The northwest sea breeze is common on most days from spring through early fall. At night and winter, southeasterly flow is common, but with lighter wind speeds. Southeasterly winds are more common in the southern portion of San José as seen by comparing the wind roses for Mineta-San José International Airport and Alviso to the Almaden IBM facility. In winter, winds become variable with more of a southeasterly orientation. Nocturnal winds and land breezes during the colder months of the year prevail with variable drainage out of the mountainous areas, but a general southerly flow in San José. Wind speeds are highest during the spring and early summer and lightest in fall. Winter storms bring relatively short episodes of strong southerly winds.

Temperatures in San José tend to be less extreme compared to further inland locations due to the moderating effect of the Pacific Ocean and the San Francisco Bay. In summer, high temperatures are generally in the low 80's and in the 50's to about 60 during winter. Low temperatures range from the 50's in summer to the 30's in winter.

Air pollution potential in the Santa Clara Valley is high. The southern end of the valley is susceptible to some of the highest ozone levels in the region. This is due to a number of effects. Air pollution emitted from the Valley combines with pollution emitted throughout much of the immediate Bay Area that is transported south through the valley. Summer days are typically characterized by relatively warm temperatures, clear skies and a relatively stable air mass. In addition, a weaker southerly sea breeze at the southern end of the valley meets the northwest sea breeze and can form a convergence zone. This area typically has low wind speeds. As a result, ozone levels in Gilroy and Morgan Hill are typically higher than those measured in San José and other upwind Peninsula stations. Ozone standards traditionally are exceeded in downwind portions of the Bay Area when this condition occurs during the warmer months of the year. Highest ozone concentrations tend to occur when high pressures strengthen over the area in late spring summer. This results in warmer temperatures, light winds and less vertical mixing.

The highest $PM_{2.5}$ levels in the region are measured in San José. Episodes of high particulate levels occur in late fall and winter when the Pacific High can combine with high pressure over the interior regions of the western United States (known as the Great Basin High) to produce extended periods of light winds and low-level temperature inversions. High $PM_{2.5}$ levels are the result of direct combustion emissions and secondary aerosol formation in the atmosphere under certain meteorological conditions. Most of these aerosols originate from gaseous air pollutants, such as nitrogen oxides (NOx).

FIGURE 1 WIND ROSE FOR SAN JOSÉ



III REGULATORY FRAMEWORK

Air Quality Standards

The Federal and California Clean Air Acts have established ambient air quality standards for different pollutants. National ambient air quality standards (NAAQS) were established by the Federal Clean Air Act of 1970 (amended in 1977 and 1990) for six "criteria" pollutants. These criteria pollutants now include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), particulate matter with a diameter less than 10 microns (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). In 1997, EPA added fine particulate matter or $PM_{2.5}$ as a criteria pollutant. These are considered the most prevalent air pollutants that are known to be hazardous to human health.

California established ambient air quality standards as early as 1969 through the Mulford-Carrol Act. Pollutants regulated under the California Clean Air Act are similar to those regulated under the Federal Clean Air Act. In many cases, California standards are more stringent than the national ambient air quality standards. Federal and State air quality standards are shown in Table 1. Both the national and California ambient air quality standards have been adopted by BAAQMD. A brief description of the six criteria air pollutants is as follows:

<u>Ozone.</u> Ground-level ozone is the principal component of smog. It is not directly emitted into the atmosphere but is formed by the photochemical reaction of reactive organic gases (ROG) and nitrogen oxides (known as ozone precursors) in the presence of sunlight. Ozone levels are highest during late spring through early summer when precursor emissions are high and meteorological conditions are favorable for the complex photochemical reactions to occur. Approximately half of the reactive organic gas and nitrogen oxide emissions in the Bay Area are from motor vehicles. Adverse health effects of ground-level ozone include respiratory impairment and eye irritation. High ozone concentrations are also a potential problem to sensitive crops such as wine grapes.

<u>Carbon Monoxide.</u> Carbon monoxide is a non-reactive pollutant that is highly toxic, invisible, and odorless. It is formed by the incomplete combustion of fuels. The largest source of carbon monoxide emissions is motor vehicles. Wood stoves and fireplaces also contribute to high levels of carbon monoxide. Unlike ozone, carbon monoxide is directly emitted to the atmosphere. The highest carbon monoxide concentrations occur during the nighttime and early mornings in late fall and winter. Carbon monoxide levels are strongly influenced by meteorological factors, such as wind speed and atmospheric stability. Strong, ground-based inversions form on cool late fall and winter evenings with very light winds and persist until the sun rises. This creates very stable atmospheric conditions that can lead to a buildup of air pollutants. In addition, use of wood burning fireplaces is highest during these periods. Wood smoke also contains carbon monoxide. Adverse health effects of carbon monoxide include the impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin, aggravation of cardiovascular disease, impairment of central nervous system function, fatigue, headache, confusion, and

dizziness. Exposure to carbon monoxide can be fatal in cases of very high concentrations in enclosed places.

Nitrogen Dioxide. Nitrogen dioxide is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the primary sources of nitrogen dioxide. Sources of NO_2 include high temperature combustion processes such as motor vehicle engines and power plants. It can also be the product of atmospheric processes where nitrogen oxides (NOx) react with ozone to create NO_2. NOx, mostly a combustion by-product, includes all nitric oxides such as NO_2 and NO. Most NOx emitted during combustion is in the form of NO, but NO_2 makes up about 10% of those initial NOx emissions. Indoor concentrations are a concern, because people spend most of their time indoors. Elevated indoor NO_2 concentrations are caused by sources such as gas appliances, and un-vented gas heating systems. Nitrogen dioxide contributes to ozone formation. Adverse health effects associated with exposure to high levels of nitrogen dioxide include the risk of acute and chronic respiratory illness. NO2 is a concern particularly for asthmatics and for infants and children. CARB updated the California ambient air quality standards for NO_2 in 2007 to reflect the latest available information on health effects associated with this pollutant.

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

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

TABLE 1 CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards [a] Primary [b,c]	National Standards [a] Secondary [b,d]
Ozone	8-hour	0.070 ppm (154 μg/m^3)	0.075 ppm (176μg/m^3)	—
	1-hour	0.09 ppm (180 μg/m^3)	--(e)	Same as primary
Carbon monoxide	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
Nitrogen dioxide	Annual	—	0.053 ppm (100 μg/m^3)	Same as primary
	1-hour	0.25 ppm (470 μg/m^3)	—	—
Sulfur dioxide	Annual	—	0.03 ppm (80 μg/m^3)	—
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 μg/m^3)
	1-hour	0.25 ppm (655 μg/m^3)	—	—
PM_{10}	Annual	20 μg/m^3	50 μg/m^3	Same as primary
	24-hour	50 μg/m^3	150 μg/m^3	Same as primary
$PM_{2.5}$	Annual	12 μg/m^3	15 μg/m^3	
	24-hour	—	35 μg/m^3	
Lead	Calendar quarter	—	1.5 μg/m^3	Same as primary
	30-day average	1.5 μg/m^3	—	—

Notes: (a) Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the EPA.

(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

(e) The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

In 1983, the California Air Resources Board (CARB) replaced the standard for "suspended particulate matter" with a standard for suspended PM_{10} or "respirable particulate matter." This standard was set at 50 $\mu g/m^3$ for a 24-hour average and 30 $\mu g/m^3$ for an annual average. CARB revised the annual PM_{10} standard in 2002, pursuant to the Children's Environmental Health Protection Act. The revised PM_{10} standard is 20 $\mu g/m^3$ for an annual average. $PM_{2.5}$ standards were first promulgated by the EPA in 1997 and were recently revised to lower the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ for 24-hour exposures. EPA revoked the annual PM_{10} standard due to lack of scientific evidence correlating long-term exposures of ambient PM_{10} with health effects. CARB has adopted an annual average $PM_{2.5}$ standard, which is set at 12 $\mu g/m^3$, which is more stringent than the federal standard of 15 $\mu g/m^3$.

Sulfur Dioxide. Sulfur dioxide is a colorless gas with a strong odor and potential to damage materials. It is produced by the combustion of sulfur containing fuels such as oil and coal. Refineries, chemical plants, and pulp mills are the primary industrial sources of sulfur dioxide emissions. Sulfur dioxide concentrations in the Bay Area are well below the ambient standards, and therefore, are not a concern in San José to regulators. Adverse health effects associated with exposure to high levels of sulfur dioxide include aggravation of chronic obstruction lung disease and increased risk of acute and chronic respiratory illness.

Lead. Lead occurs in the atmosphere as particulate matter. It was primarily emitted by gasoline-powered motor vehicles, although the use of lead in fuel has been virtually eliminated. Because of lead being eliminated from fuels, levels in the Bay Area have dropped dramatically. Lead concentrations in the Bay Area are well below the ambient standards.

Toxic Air Contaminants (TACs)

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

HAPs are the air contaminants identified by U.S. EPA as known or suspected to cause cancer, serious illness, birth defects, or death. Many of these contaminants originate from human activities, such as fuel combustion and solvent use. Mobile source air toxics (MSATs) are a subset of the 188 identified HAPs. Of the 21 HAPs identified by EPA as MSATs, a list of six priority HAPs were identified that include: diesel exhaust, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. While vehicle miles traveled in the United States is expected to increase by 64% over the period 2000 to 2020, the

Federal Highway Administration reports that emissions of MSATs are anticipated to decrease substantially as a result of efforts to control mobile source emissions. This reduction would be 57 percent to 67 percent depending on the contaminant (FHWA 2006).

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

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

CARB reports that recent air pollution studies have shown an association that diesel exhaust and other cancer-causing toxic air contaminants emitted from vehicles are responsible for much of the overall cancer risk from TACs in California. Particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) was found to comprise much of that risk. In August 1998, CARB formally identified DPM as a TAC. Diesel particulate matter is of particular concern since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by EPA as HAPs, and by CARB as TACs. Diesel engines emit particulate matter at a rate about 20 times greater than comparable gasoline engines. The vast majority of diesel exhaust particles (over 90 percent) consist of $PM_{2.5}$, which are the particles that can be inhaled deep into the lung. Like other particles of this size, a portion will eventually become trapped within the lung possibly leading to adverse health effects. While the gaseous portion of diesel exhaust also contains TACs, CARB's 1998 action was specific to DPM, which accounts for much of the cancer-causing potential from diesel exhaust. California has adopted a comprehensive diesel risk reduction program to reduce DPM emissions 85 percent by 2020. The U.S. EPA and CARB adopted low sulfur diesel fuel standards in 2006 that reduce diesel particulate matter substantially.

Smoke from residential wood combustion can be a source of TACs. Wood smoke is typically emitted during wintertime when dispersion conditions are poor. Localized high

TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind; the pollution can persist for many hours, especially in sheltered valleys during winter. Wood smoke also contains a significant amount of PM_{10} and $PM_{2.5}$. Wood smoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

Federal Air Quality Regulations

If an area does not meet NAAQS over a set period (three years), EPA designates it as a "nonattainment" area for that particular pollutant. EPA requires states that have areas that do not comply with the national standards to prepare and submit air quality plans showing how the standards would be met. If the states cannot show how the standards would be met, then they must show progress toward meeting the standards. These plans are referred to as the State Implementation Plan (SIP). Under severe cases, EPA may impose a federal plan to make progress in meeting the federal standards.

<u>Carbon Monoxide</u>

Prior to 1998, the Bay Area was a "moderate nonattainment" area for carbon monoxide due to localized exceedances of the national carbon monoxide standards in downtown San José and Vallejo. The carbon monoxide standards have not been exceeded since 1991. Since the region had not experienced exceedances of the carbon monoxide standards, the San Francisco Bay Area Redesignation Request and Maintenance Plan for the Carbon Monoxide national ambient air quality standard was approved by the U. S. EPA in 1998. That action reclassified the area as a carbon monoxide "attainment" area.

<u>Ozone</u>

Prior to 1995, the San Francisco Bay Area air basin was classified by EPA as a "moderate nonattainment" area for ozone, since some air pollutant monitors in the area routinely measure concentrations exceeding the national one-hour ozone standard. In 1993, after three years of monitoring compliance with the one-hour ozone standard, the Bay Area Air Quality Management District (BAAQMD) submitted the 1993 Ozone Maintenance Plan to EPA to request the redesignation of the region to an ozone maintenance area. The plan included measures to maintain the attainment of the ozone NAAQS. In 1995, EPA formally recognized that the area attained the ozone standard and approved the 1993 Ozone Maintenance Plan. The Bay Area was classified by EPA as a "maintenance" area, since the region had not violated the ozone standard for 5 years (1990-1994). However, violations of the national one-hour ozone standards occurred during the summers of 1995 and 1996. As a result, in 1997 EPA revoked the region's clean air status and designated the area as an "unclassified nonattainment" area for ozone. In April 2004, EPA designated the Bay Area as a "marginal nonattainment" area under the 8-hour ozone NAAQS. The U.S. EPA then revoked the NAAQS for one-hour ozone in 2005. Recent monitoring data does indicate that the Bay Area was meeting the 8-hour NAAQS for ozone; however, BAAQMD and CARB did not request attainment redesignation. EPA recently approved a newer slightly more stringent 8-hour ozone NAAQS.

Other Criteria Pollutants

For all criteria pollutants other than ozone, the San Francisco Bay Area air basin is in attainment of the NAAQS. The Bay Area counties, including Santa Clara County, have not measured ambient air pollutant concentrations in excess of those allowed by the NAAQS for all other criteria air pollutants. However, violations of the new 24-hour NAAQS for $PM_{2.5}$ have been recorded in the Bay Area. These violations have occurred in Vallejo and San José. $PM_{2.5}$ in the Bay Area is treated as a regional air pollutant, even though there can be localized sources that can contribute to exceedances of the standard. U.S. EPA, in agreement with CARB, recently acted to designate the Bay Area as nonattainment for $PM_{2.5}$.

Clean Air Act SIP Conformity

Under Section 176(c) of the 1990 Clean Air Act Amendments, the "conformity" provisions for Federal projects are outlined. Federal actions are required to conform to the requirements of a SIP and must not jeopardize efforts for a region to achieve the NAAQS. Section 176(c) also assigns primary oversight responsibility for conformity assurance to the federal agency undertaking the project, not the EPA, state, or local agency. For conformity, federally-supported or funded activities must not (1) cause or contribute to any new air quality standard violation, (2) increase the frequency or severity of any existing standard violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other SIP milestone aimed at bringing the region into attainment.

In 1993, the U.S. EPA issued conformity regulations that addressed transportation projects (Transportation Conformity) and conformity of all other non-transportation federal actions (General Conformity). The primary requirements of the transportation conformity rule are that implementation of transportation plans or programs cannot produce more emissions of pollutants than budgeted in the latest SIP.

EPA also has programs for identifying and regulating toxic air contaminants. The Clean Air Act requires EPA to set standards for air toxics and sharply reduce emissions of controlled chemicals. Industries were classified as major sources if they emitted certain amounts of toxic air contaminants.

California Air Quality Regulations

The California Clean Air Act of 1988, amended in 1992, outlines a program for areas in the State to attain the CAAQS by the earliest practical date. The CARB is the state air pollution control agency and is a part of the California Environmental Protection Agency. The California Clean Air Act set more stringent air quality standards for all of the pollutants covered under national standards, and additionally regulates levels of vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates. If an area does not meet CAAQS, CARB designates the area as a nonattainment area. Based on the California standards, the Bay Area is a serious nonattainment area for ozone (since the area cannot forecast attainment of the state ozone standard in the foreseeable future). It is also a state nonattainment area for PM_{10} and $PM_{2.5}$. The Bay Area has met CAAQS for all other air pollutants. CARB requires regions that do not meet CAAQS for ozone to submit clean air plans that describe plans to attain the standard.

CARB regulates the amount of air pollutants that can be emitted by new motor vehicles sold in California. Motor vehicle emissions standards have always been more stringent than federal standards since they were first imposed in 1961. CARB has also developed on-road vehicle Inspection and Maintenance programs known as "Smog Check" programs with the California Bureau of Automotive Repair[1]. The Smog Check program is administered by the Bureau of Automotive Repair. Inspection programs for trucks and buses have also been implemented. CARB has authority to set standards for fuel sold in California. Air pollution requirements for consumer products sold in California are also controlled by CARB.

CARB provides oversight for local air pollution control programs and compiles or develops innovative control measures. CARB is responsible for submitting State Implementation Plans (SIPs) to the U.S. EPA that demonstrate how each nonattainment air basin will meet the NAAQS. These plans are developed by the regional air pollution control districts and then submitted to CARB for review and eventual submittal to the EPA.

In many parts of the State, CARB monitors air quality levels and measures toxic air contaminants. CARB also studies the exposure of California's population to these pollutants and contaminants.

Regional Air Quality Regulations

Regional air quality is regulated by BAAQMD. BAAQMD regulates stationary sources (with respect to federal, State, and local regulations), monitors regional air pollutant levels (including measurement of toxic air contaminants), develops air quality control strategies and conducts public awareness programs. BAAQMD has also developed CEQA guidelines that establish significance thresholds for evaluating new projects and plans and provide guidance to lead agencies for evaluating air quality impacts of projects and plans.

The Air Toxic "Hot Spots" Information and Assessment Act was enacted by the California Legislature. This act, known also as AB2588, is intended to identify toxic air contaminant hot spots where emissions from specific sources may expose individuals to elevated risk of adverse health effects. Businesses or establishments (including dry cleaning facilities) identified as a significant source or toxic air emissions are required to

[1] Inspection and Maintenance (I/M) refers to the federally mandated requirements for State's to perform checks on in-use vehicle emissions for areas identified by EPA as nonattainment or maintenance under the federal Clean Air Act. Smog Check is California's program to conduct these inspections.

notify the affected population and provide them with information about the associated health risk. The implementation and enforcement provisions of this Act are the responsibility of BAAQMD.

BAAQMD administers the Toxic Air Contaminant Control Program. The main objective of this program is to reduce public exposure to toxic air contaminants. BAAQMD has regulated air toxics since the 1980's. To date, a risk-based approach, meaning that decisions over what sources and pollutants to control and the degree of control have been based on results of health risk assessments.

After the level of risk from a new project has been determined, a decision must be made as to the significance of this risk level. If a new source has a cancer risk of one in a million or less over a 70-year-lifetime exposure period, and will not result in non-cancer health effects, it is considered a non-significant risk and no further review of all health impacts is required. If a project has a risk greater than one in a million, it must be further evaluated in order to determine acceptability. Factors that affect acceptability include the presence of controls on the rate of emissions, the location of the site in relation to residential areas and schools, and contaminants reductions in other media such as water. In general, projects with risks greater than one in a million, but less than ten in a million, are approved if other determining factors are acceptable, but projects with risks greater than ten in a million are not approved. Non-approved projects may be reevaluated if emissions are reduced thus reducing their risks.

On July 9, 2008, the BAAQMD Board adopted Regulation 6, Rule 3: Wood-burning Devices, which will reduce emissions that come from residential wood burning. This new rule restricts wood burning when air quality is unhealthy and wintertime Spare the Air Advisory is issued. The rule also requires that only cleaner burning EPA certified stoves and inserts be installed in new construction or remodels, including natural gas fireplaces. The regulation also places limits on excessive smoke, prohibits the burning of garbage and other harmful materials, and also requires the labeling of firewood and solid fuels sold within the Bay Area.

Air Quality Planning

<u>Clean Air Plans</u>

As discussed above BAAQMD, along with the other regional agencies (i.e., Association of Bay Area Governments and the Metropolitan Transportation Commission), has prepared the Ozone Attainment Plan to address the federal standard for ozone. A Carbon Monoxide Maintenance Plan was also prepared in 1994 (and approved by the U.S. EPA in 1998) to demonstrate how the federal carbon monoxide standard would be maintained.

The Bay Area Clean Air Plan was prepared in 1991 to address the more stringent requirements of the California Clean Air Act with respect to ozone. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter State air quality standards, as mandated by the California Clean Air Act. The plan was designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. Air quality plans addressing the California Clean Air Act are developed on a triennial basis, with the latest approved update to the plan developed in 2005 (i.e., *2005 Bay Area Ozone Strategy*). This plan included implementation of transportation control measures (TCMs) and programs such as *Spare the Air*. Some of these measures or programs rely on local governments for implementation.

BAAQMD is beginning a process to develop the 2009 Clean Air Plan per the requirements of the California Clean Air Act. The 2009 Clean Air Plan will include an update to the Ozone Strategy. The plan will also address PM_{10} and $PM_{2.5}$ as well as climate change. Adoption of the Plan is expected in 2009.

A key element in air quality planning is to make reasonably accurate projections of future human activities that are related to air pollutant emissions. The most important is vehicle activity. BAAQMD uses population projections made by the Association of Bay Area Governments (ABAG) and vehicle use trends made by the Metropolitan Transportation Commission (MTC) to formulate future air pollutant emission inventories. The basis for these projections comes from cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When individual projects are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region. The 2005 Bay Area Ozone Strategy was developed using ABAG 2003 Projections.

The clean air planning efforts for ozone will also reduce PM_{10} and $PM_{2.5}$, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. In addition, BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM_{10} and $PM_{2.5}$ emissions (e.g., Winter Spare the Air alerts). SB 656 requires further action by CARB and air districts to reduce public exposure to PM_{10} and $PM_{2.5}$. Efforts identified by BAAQMD in response to SB656 are primarily targeting reductions in wood smoke emissions and adoption of new rules to further reduce NOx and particulate matter from internal combustion engines and reduce particulate matter from commercial charbroiling activities. NOx emissions contribute to ammonium nitrate formation that resides in the atmosphere as particulate matter. The Bay Area experiences the highest PM_{10} and $PM_{2.5}$ in winter when wood smoke and ammonium nitrate contributions to particulate matter are highest. It is illegal for Bay Area residents and businesses to burn wood or manufactured fire logs in fireplaces, wood stoves and inserts, pellet stoves, and outdoor fire-pits on nights where BAAQMD declares a Spare the Air alert in winter. Building permits issued after January 1, 2009 may not permit conventional fireplaces, non-U.S. EPA certified woodstoves, and/or fireplace inserts. Natural gas fueled fireplaces are allowed.

<u>BAAQMD CARE Program</u>

BAAQMD's 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 (*see http://www.baaqmd.gov/CARE/*). The program examines TAC emissions from point sources, area sources and on-road (e.g., cars and trucks) and off-road (e.g., construction equipment, trains, and aircraft) mobile sources with an emphasis on diesel particulate matter (DPM), which is the major contributor to airborne health risk in California. The goal is to identify areas with high emissions of TACs that have sensitive populations nearby and then use that information to guide policies, regulations, incentive funding, and other programs to reduce exposures to the sensitive populations.

In Phase 1 of the program, a 2-kilometer by 2-kilometer gridded inventory of TAC emissions was developed for the year 2000. The data were analyzed and then updated to include the most recent 2005 emission data. This emissions inventory was risk-weighted to reflect the differences in potency of the various TACs. For example, benzene has far higher cancer potency than many other compounds such as MTBE. While DPM is not as potent as benzene, the emissions are much more prevalent. The Phase 1 report documents results and presents the emissions inventory along with demographics regarding sensitive populations and asthma hospitalization rates for children (BAAQMD 2006). The Phase I study identifies diesel emissions from heavy-duty trucks as a major source of TAC emissions and identifies programs available to reduce these emissions. New (model 2007 or newer) trucks have much lower emission rates. However, turnover of the fleet will only slowly reduce these emissions as trucks tend to be in place on roadways for many years. The Phase I study identifies the high cost of targeting BAAQMD funding mechanisms to reduce these emissions.

In Phase II of the CARE program, BAAQMD is performing regional and local-scale modeling to determine the significant sources of DPM and other TAC emissions locally in the priority communities as well as for the entire Bay Area. The BAAQMD has partnered with CARB, the Port of Oakland, Pacific Institute, West Oakland Environmental Indicators Project, and the railroads to prepare specific health risk assessments.

One of highlights of the CARE program is the development of the Mitigation Action Plan where risk reduction activities are focused on the most at-risk communities. This plan identified 6 different at-risk communities that would benefit from targeted mitigation that were based on TAC emissions and presence of sensitive receptor groups. One of the six communities is San José. The mitigation action plan calls for the following:

- Allocating grant and incentives to the priority communities;

- Conducting outreach efforts in these communities to solicit and gain feedback from the community as how best to address and reduce TAC emissions;

- Working with local city and county health departments to reduce TAC emissions in these communities;

- Developing local land use guidance to assist city and county planners, community members, and developers in assessing risks from land use projects and exposure to mobile and stationary sources of TAC emissions (note that this guidance is likely to be included as part of a major update to the BAAQMD's CEQA Guidelines);

- Developing rules and regulations that would require reduction of TAC emissions from significant sources.

In Phase III, BAAQMD plans to conduct an extensive exposure assessment to identify and rank the communities as to their potential TAC exposures and determine the types of activities that places them at highest risk. BAAQMD will also pursue additional mitigations and attempt to develop a metric to measure the effectiveness of these measures.

San José General Plan

The San José General Plan includes the following policies intended to control or reduce air pollution impacts:

- *Air Quality Policy 1* states that the City should take into consideration the cumulative air quality impacts from proposed developments and should establish and enforce appropriate land uses and regulations to reduce air pollution consistent with the region's Clean Air Plan and State law.

- *Air Quality Policy 2* states that expansion and improvement of public transportation services and facilities should be promoted, where appropriate, to both encourage energy conservation and reduce air pollution.

- *Air Quality Policy 3* states the City should urge effective regulation of those sources of air pollution, both inside and outside of San José, which affect air quality. In particular, the City should support Federal and State regulations to improve automobile emission controls.

- *Air Quality Policy 4* the City should foster educational programs about air pollution problems and their solutions.

- *Air Quality Policy 5* states that in order to reduce vehicle miles traveled and traffic congestion, new development within 1,000 feet of an existing or planned transit station should be designed to encourage the usage of public transit and minimize the dependence on the automobile through the application of site design guidelines.

- *Air Quality Policy 6* states City should continue to actively enforce its ozone-depleting compound ordinance and supporting policy to ban the use of chlorofluorcarbon compounds (CFCs) in packaging and in building construction and remodeling to help reduce damage to the global atmospheric ozone layer. The City may consider adopting other policies or ordinances to reinforce this effort.

The following Energy Conservation and Transportation policies and programs included in the General Plan would also help improve air quality:

- *Energy Policy 1* states that the City should promote development in areas served by public transit and other existing services. Higher residential densities should be encouraged to locate in areas served by primary public transit routes and close to major employment centers.

- *Energy Policy 2* states that decisions on land use should consider the proximity of industrial and commercial uses to major residential areas in order to reduce the energy used for commuting.

- *Energy Policy 3* states public facilities should be encouraged to locate in areas easily served by public transportation.

- *Transportation, Pedestrian Facilities, Policy 17* states that pedestrian travel should be encouraged as a mode of movement between residential and non-residential areas throughout the City and in activity areas.

- *Transportation, Pedestrian Facilities, Policy 19* states that the City should encourage walking, bicycling, and public transportation as preferred modes of transportation.

- *Transportation, Pedestrian Facilities, Policy 23* states that each land use has different pedestrian needs. Street and sidewalk designs should relate to the function of the adjoining land use(s) and transit access points.

- *Transportation, Transportation Systems Management/Transportation Demand Management, Policy 28* states that the City should promote participation and implementation of appropriate Transportation Demand Management measures such as carpooling and vanpooling, preferential parking and staggered work hours/flextime, as well as bicycling and walking, by all employers.

- *Transportation, Bicycling, Policy 51* states that the City should develop a safe, direct, and well-maintained transportation bicycle network linking residences, employment centers, schools, parks and transit facilities and should promote bicycling as an alternative mode of transportation for commuting as well as for recreation.

- *Transportation, Bicycle, Policy 53* states that priority improvements to the Transportation Bicycle Network should include: bike routes linking light rail stations to nearby neighborhoods, bike paths along designated trails and pathway corridors, and bike paths linking residential areas to major employment centers.

- *Hazardous Waste Management Policy 5* states all proposals for hazardous waste facilities shall be consistent with the plans and policies of air and water quality regulatory agencies (i.e., Air Quality Management District, and the Regional Water Quality Control Board and this City).

BAAQMD CEQA Guidelines

BAAQMD has prepared CEQA Guidelines to assist lead agencies, analysts, project proponents, and other interested parties in evaluating potential air quality impacts of projects and plans proposed in the Bay Area. The guidelines recommend procedures for evaluating projects or plans and thresholds to determine whether the impacts are significant. These guidelines also provide direction for identifying measures to mitigate impacts. The current guidelines (as of this writing) were last updated in 1999. BAAQMD is currently updating these guidelines and plans to adopt new guidelines by late summer 2009.

BAAQMD CEQA Guidelines recommend significance thresholds as follows:

- Construction Impacts. BAAQMD normally considers on-site construction-related emissions as short-term in duration. PM_{10}, caused by onsite dust generation, is the pollutant of greatest concern. Other emissions from construction equipment are included in emission inventories that are the basis for regional air quality planning. The BAAQMD CEQA Guidelines identify feasible control measures for emissions of PM_{10} that would greatly reduce the impacts from construction activities. Under the guidelines, proper incorporation of these measures would result in less than significant construction-related impacts to air quality. Currently, there are no quantifiable significance thresholds for temporary construction impacts.

- Local Carbon Monoxide Concentrations. A project would have a significant adverse impact if it causes a violation of any air quality standard or contributes substantially to an existing or projected air quality violation. A significant impact to local air quality is defined under the guidelines as increased carbon monoxide concentrations at the closest sensitive receptors that cause a violation of the most stringent ambient standard for carbon monoxide (20 ppm for the one-hour averaging period, 9.0 ppm for the eight-hour averaging period).

- Total Emissions. A significant impact on air quality is defined under the guidelines as an increase in emissions of any ozone precursor pollutant (i.e., reactive organic gases or nitrogen oxides) or PM_{10} exceeding 80 pounds per day (or 15 tons/year). Total operational emissions include direct and indirect emissions.

- Toxic Air Contaminants. Exposing sensitive receptors or the public to substantial levels of toxic air contaminants would be considered significant. A significant impact is defined as follows: 1) the probability of contracting cancer for the Maximally

Exposed Individual (MEI) exceeds ten in one million; or 2) ground-level concentrations of non-carcinogenic toxic air contaminants would result in a hazard index greater than one for the MEI[2].

- Odors. Any project with the potential to expose members of the public frequently to objectionable odors would be considered significant. Analysis of potential odor impacts should be analyzed for both of the following situations: 1) sources of odorous emissions locating near existing receptors, and 2) receptors locating near existing odor sources. The BAAQMD CEQA Guidelines identify screening distances between potential odor sources and receptors that should be considered when evaluating odor impacts.

- Acute Hazardous Air Emissions or Accidental Releases. A determination of significance for potential impacts from accidental releases of acutely hazardous materials should be made in consultation with the local administering agency of the Risk Management Prevention Program (RMPP). This determination should be made for both projects using or storing acutely hazardous materials proposed near existing receptors as well as proposed projects locating near existing facilities that use or store these materials.

- Cumulative Impacts. Any project that would individually have a significant air quality impact is also considered to have a significant cumulative air quality impact. For other projects (i.e. General Plan amendments), the determination of a significant cumulative air quality impact should be based on the consistency of the project with the Bay Area's most recently adopted Clean Air Plan. In order to show consistency with the Clean Air Plan, the project must be consistent with the Countywide Plan (i.e., not requiring a General Plan Amendment) and the Countywide Plan must be found to be consistent with population and travel assumptions used to develop the Clean Air Plan. In addition, the project and Countywide Plan must incorporate the control measures contained in the Clean Air Plan. The Clean Air Plan uses the latest population and travel estimates developed by the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG). Projects located in a jurisdiction where the general plan is not consistent with the Clean Air Plan would be required to compare the impacts of the project along with recent past, present and reasonably foreseeable future projects to the thresholds described above.

Note: Although the effects of a pre-existing contaminated environment upon a proposed project may be beyond the scope of CEQA, BAAQMD recommends that impacts of existing sources of air pollution on proposed project occupants be analyzed. Such impacts include those from toxic air contaminants, odors, and dust.

[2] The hazard index is the ratio of the predicted concentration to the concentration in which that hazardous contaminant would cause an adverse health effect. These impacts are addressed at the MEI, which could be a sensitive receptor or a worker type exposure where the maximum exposure for each different receptor type is predicted.

The BAAQMD is currently developing a major update to their CEQA Guidelines. This update is expected to include new significance thresholds with expanded coverage to include construction activities. The BAAQMD is considering different thresholds for air pollution burdened areas, mainly to address TAC emissions and their associated health risks. The update will likely include guidance to evaluate greenhouse gas emissions that lead to global warming. Current schedules indicate that the updated guidelines will be adopted in mid- to late-summer 2009.

CARB Air Quality and Land Use Handbook

In 2005, CARB released the final version of the Air Quality and Land Use Handbook, which is intended to encourage local land use agencies to consider the risks from air pollution prior to making decisions that approve the siting of new sensitive receptors (e.g., homes or daycare centers) near sources of air pollution. Unlike industrial or stationary sources of air pollution, siting of new sensitive receptors does not require air quality permits, but could create air quality problems. The primary purpose of the document is to highlight the potential health impacts associated with close proximity to common air pollution sources and to have those issues considered in the planning process. CARB makes recommendations regarding the siting of new sensitive land uses near freeways, truck distribution centers, dry cleaners, gasoline dispensing stations, and other air pollution sources. CARB acknowledges that land use agencies have to balance other siting considerations such as housing and transportation needs, economic development priorities and other quality of life issues. These "advisory" recommendations, summarized in Table 2, are based primarily on modeling information and may not be entirely reflective of conditions in San José. The siting of new sensitive land uses within these advisory distances may be possible, but only after site-specific studies are conducted to identify the actual health risks.

<u>Freeways or Busy Arterials</u>

Interstate 280, Interstate 680, Interstate 880, U.S. 101, State Routes 17, 82, 85, 87 and 237 are the primary freeways that run through San José. In addition, there are several large expressways running through San José. Many of the freeway segments in San José carry more than 100,000 daily traffic trips. All of the expressways in San José have less than 50,000 daily traffic trips. CARB recommends that land use decisions avoid placing new sensitive receptors near freeways or busy arterials. CARB has recommended that new sensitive land uses should avoid being placed within 500 feet of freeways and urban roadways with 100,000 or more vehicles per day.

TABLE 2 CARB RECOMMENDED SETBACK DISTANCES FOR COMMON SOURCES OF TOXIC AIR CONTAMINANTS

Source Type	Recommended Buffer Distance
Freeways and busy arterial roadways[1]	- 500 feet
Distribution Centers with 100 or more daily truck trips or 40 daily truck trips that use refrigeration units	- 1,000 feet
Rail Yards	- 1,000 feet from a major service or maintenance rail yard (consider possible siting limitations and mitigation approaches within one mile)
Dry cleaners (onsite dry cleaning)	- 300 feet for any dry cleaning operation - at least 500 feet for operations with 2 or more machines
Large gasoline stations (i.e. over 3.6 million gallons pumped per year)	- 50 feet for typical gas stations - up to 300 feet for large gas stations
Chrome Plating Operations	- 1,000 feet from a chrome plating operation that emits hexavalent chromium

Notes: [1] For roadways with 100,000 daily trips.

A review of air pollution studies by CARB indicates that residing close to freeways or busy roadways may result in adverse health effects beyond those typically found in urban areas. Several studies found an association between adverse non-cancer health effects (e.g., asthma) and living or attending school near heavily traveled urban roadways. Many of these studies focused on children and developed causal links. That is they have linked proximity of the freeway with hospital or medical visits. However, these proximity studies (and others) found that the roadway and truck traffic densities were key factors affecting the strength of association with adverse health impacts. For urban roadways, the association of traffic-related emissions with adverse health impacts was generally strongest between 300 and 1,000 feet.

Proximity to freeways increases cancer risk and exposure to particulate matter. Diesel particulate matter, or DPM, poses the greatest cancer risk from roadways. On average, CARB reports that DPM represents about 70 percent of the potential cancer risk from vehicle travel. The number and type of diesel-fueled vehicles on any roadway is key in understanding the potential cancer risks. Benzene and 1,3 butadiene are carcinogenic toxic air contaminants that are also emitted from motor vehicles and contribute to potential cancer risks. There are other contaminants emitted from motor vehicles, but their potential risks are much smaller.

CARB reviewed studies that found measured air pollution concentrations from motor vehicles drop off dramatically between the source and 500 feet. These studies were consistent with CARB air quality modeling and risk analyses performed for freeways. The estimated risk from DPM exposure was found to vary substantially due to meteorology, where typical downwind areas had much higher risk than upwind areas. Freeways with low truck volumes had lower risks. CARB based their 500-foot buffer recommendation on review of the studies and air dispersion modeling. CARB's modeling was based on year 2000 truck and automobile information that included higher DPM emissions rates. New vehicle standards, diesel fuel reformulation, and CARB adopted Diesel Risk Reduction Measures has resulted in lower potential cancer risks near freeways.

Truck Distribution Centers

CARB identified proximity to truck distribution centers or warehouses as a potential source of DPM exposure. The range of exposure for these centers varies greatly, based on size, number of diesel trucks, types of trucks, on-site diesel equipment, and use of auxiliary diesel-powered equipment (e.g., diesel-powered transport refrigeration units). CARB modeled a distribution center that had over 40 transport refrigeration units (TRUs), each loading and unloading for one hour each day, seven days per week. CARB modeling results for based on year 2000 truck emission rates indicate that significant cancer risks could extend out about 500 meters or about 1,600 feet from such a facility. CARB recommends a buffer of 1,000 feet between large distribution centers and sensitive receptors. Buffers for smaller facilities should be considered on a case-by-case basis that depends on the size, activity and types of trucks or equipment used at the facilities.

Dry Cleaning Operations

Perchlorethylene (Perc) is a solvent used commonly in dry cleaning. Perc is a TAC, because it has the potential to cause cancer. Other non-cancer health effects can occur at higher exposures. Dry cleaning operations are typically located in urban areas. Some of these operations occur in the same buildings that have residential occupants. CARB reviewed air-sampling studies and found a wide range of exposures, depending on the type and maintenance of dry cleaning equipment. For exposures in the same building, a well maintained state of the art system results in cancer risks in the range of 10 in one million, while a poorly maintained machine with leaks can have risk much higher. The risk created by dry cleaning operations that use Perc is dependent on the amount of Perc emissions, proximity of sensitive receptors to the source, and how the emissions are dispersed (local meteorology).

Most dry cleaning operations in California have one dry cleaning machine per facility. Some larger facilities may have two machines. The South Coast Air Quality

Management District estimated an average risk of 80 in one million for residential exposures at 75 feet from a facility (SCAQMD 2002). The range of risks found at 75 feet ranges from 25 to 140 in one million. Based on these estimates, CARB recommended a buffer of 300 feet between new sensitive land uses and any dry cleaning operation (i.e., a facility that conducts dry cleaning using Perc on site). An increased buffer of 500 feet was recommended for any facility that has two machines.

As a result of identifying Perc as a TAC, CARB developed an Air Toxic Control Measure (ATCM) addressing Perc emissions from dry cleaning operations in 1993. A study conducted by CARB staff in 2003 found that emissions had been reduced by 70 percent, but further reductions were achievable. In 2007, CARB approved amendments to the Dry Cleaning ATCM and the adoption of requirements for Perc manufacturers and distributors. The amendments, which became State law in December 2007, will over time phase out the use of Perc dry cleaning machines and related equipment by 2023. CARB has identified alternative cleaning methods to replace perc that include water-based cleaning processes, use of liquid CO_2, alternative solvents, and use of other newly developed products and technology. The sale or lease of any new Perc dry cleaning equipment was unlawful beginning in 2008. Beginning July 2010, all Perc machines at buildings co-located with residences must be removed and any machine over 15 years of age cannot be operated. The anticipated exposures from Perc will be reduced significantly as a result of the new ATCM amendments that affect dry cleaning operations. Cancer risks, upon which CARB based their recommended buffers, are computed over a 70-year almost continuous exposure. The Perc exposures would be reduced by 80% or more as a result of the new ACTM amendments. As a result, siting of new sensitive receptors may be allowed within 100 feet of these operations. It should be noted that many dry cleaners contract to have the cleaning done off site.

Gasoline Dispensing Stations

Benzene, a potent carcinogen, is released into the air during motor vehicle refueling. Most benzene is emitted from motor vehicle and motor vehicle related activity. Refueling results in a small fraction of overall benzene emissions. However, gasoline-dispensing stations can have high-localized emissions as benzene is part of the volatile gases that evaporate into the atmosphere during refueling. Benzene emissions have been reduced by over 75% in California since 1990.

Some gasoline dispensing stations are located in areas close to residential areas. CARB estimates that the benzene emissions from the largest gasoline stations may result in elevated health risks in the local proximity. Well maintained vapor recovery systems, which are required in the Bay Area, can decrease benzene emissions by 90%. CARB reported that almost all gasoline dispensing stations in California had an annual throughput of 2.4 million gallons per year or less. The highest four percent had an average annual throughout of 3.6 million gallons per year. These were very large gasoline dispensing stations. CARB found the cancer risks associated with these stations to be about 10 in one million at a distance of 50 feet. Fueling stations throughout California are currently upgrading vapor recovery systems on fuel pumps to reduce VOC emissions that contribute to ozone formation. These systems will also reduce benzene emissions. Although CARB has allowed local air districts to exercise discretion in requiring stations to meet the April 2009 deadline, approximately 80 percent of stations have either complied or are in the process of complying with these new requirements.

Rail Yards

Rail yards are a major source of DPM emissions from train, loading/unloading diesel-powered equipment, and truck traffic. Rail yards tend to include inter-modal facilities. Diesel particulate matter emitted from train locomotives and trucks are the primary pollutant of concern. CARB recommends a siting setback of at least 1,000 feet from large active rail yards. The recommendation is general and does not distinguish between different types of rail yards in California or the prevailing dispersion conditions that are site specific.

To date, CARB has evaluated the public health risks associated with many different yards covered in the agreement with the railroads. Originally, potential cancer risk was evaluated by CARB for the Union Pacific rail yard in Roseville, CA. Comprehensive emissions analysis and air dispersion modeling were conducted to identify potential cancer risks. The analysis identified a large area of elevated potential cancer risk associated with the rail yard operations. Much of the emissions came from locomotive operations. Based on this analysis, the CARB *Air Quality and Land Use Handbook* recommended that communities "avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard" and "within one mile of a rail yard, consider possible siting limitations and mitigation approaches."

The Roseville rail yard is one of the largest service and maintenance yards along the Pacific Coast. The CARB handbook indicates the rail yard emitted about 25 tons of DPM per year. CARB recently evaluated the BNSF Railways rail yard in Richmond, CA and found that emissions were less than one-fifth those of the Roseville rail yard or less than five tons per year[3]. There is no available information regarding the activity at the Milpitas Yard that would provide some comparison to the Richmond or Roseville yards. The Richmond study did show existing elevated cancer risks of 10 in one million or greater extending 3,000 to 5,000 from the rail yard. These risks are expected to be reduced in future years. CARB has not identified any major rail yards in San Jose. However, Caltrain does have a maintenance facility located near West Taylor Street.

IV EXISTING AIR QUALITY CONDITIONS

Air quality is affected by the rate of pollutant emissions and by meteorological conditions such as wind speed, atmospheric stability, and mixing height, all of which affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while short-term variations result from changes in atmospheric conditions.

[3] CARB. 2007. Health Risk Assessment for the BNSF Railway Richmond Railyard, Stationary Source Division. November 20.

Criteria Air Pollutants

Bay Area

The San Francisco Bay Area annually exceeds the California Ambient Air Quality Standard for one-hour ozone, 8-hour ozone and 24-hour average PM_{10} levels. Throughout the Bay Area, the previous national one-hour ozone standard (revoked in 2005) was exceeded at one or more stations from zero to three days annually over the last five years and the new 8-hour ozone standard was exceeded from zero to 12 days annually. The number of days that, on an annual basis, exceeded the more stringent one-hour State ozone standard at one or more stations in the Bay Area ranged from 7 to 22 days over the last five years. The NAAQS for PM_{10} is not exceeded anywhere in the Bay Area, but the more stringent state standard is routinely exceeded in the Bay Area and most other parts of the state. The new NAAQS for $PM_{2.5}$ is routinely exceeded at monitors in Vallejo and San José. As a result, U.S. EPA acted to designate the entire region as nonattainment for $PM_{2.5}$. Some monitors in the Bay Area exceed the State annual $PM_{2.5}$ standard. No other air quality standards are exceeded in the Bay Area. As a result, the San Francisco Bay region is considered nonattainment for ground-level ozone and $PM_{2.5}$ at both the State and Federal level, and nonattainment for PM_{10} at the State level only. The San Francisco Bay region currently complies with State and Federal standards for all other air pollutants (e.g., carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead).

Progress has been made in reducing ozone levels. Over the last 20 years, the peak one-hour concentrations throughout the Bay Area have declined more than 20 percent. The number of days that standards were exceeded shows a similar trend. The trend has not been consistently downward. Concentrations and number of exceedances generally declined from 1980 to 1994 but increased sharply from 1995 to 1998. Levels in 1999 through 2005 have declined from levels in 1995. There were more exceedances in 2006, mainly due to an abnormal extended heat wave that occurred in July. Indications are that the Bay Area will attain NAAQS in a timely manner; however, continued progress is required to meet the more stringent State ozone standards.

PM_{10} and $PM_{2.5}$ are the other pollutants of concern since the area exceeds the State ambient air quality standards. Since PM_{10} sampling in the Bay Area began in 1988, mean annual levels have decreased by about 25 percent. The calculated number of annual exceedances of the 24-hour standard has decreased from a high of over 100 days in 1991 to about 50 days in 2001. The national 24-hour PM_{10} standard was last exceeded in 1991.

Carbon monoxide concentrations have declined substantially over the last 20 years. Current peak levels in the Bay Area are less than half of 1980 levels and neither state nor national standards have been exceeded since 1991. As a result, the area has attained the standard. Much of the decline is attributed to cleaner motor vehicles and use of cleaner burning fuels.

San José

In 2007, the BAAQMD operated a network of 27 permanent monitoring stations in the Bay Area. In addition, CARB operated one station. These stations monitored air pollutant levels continuously. The BAAQMD operates a station in San José on Jackson Street. Previously, a station on Tully Road was operated to monitor PM_{10}. The station was closed in 2007 because the site no longer met EPA siting criteria for PM_{10} due to development near the site. A summary of air quality monitoring data is shown in Table 3. The values in the table are the highest air pollutant levels measured at these stations over the past 5 years (2003-2007). In the most recent 3 years, this site recorded one exceedance of the national 8-hour ozone standard, 32 exceedances of the revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$, and seven exceedances of the California 24-hour PM_{10} standard. Air quality conditions in San José are described for each criteria air pollutant in Table 3. The number of days that measured concentrations exceeded the NAAQS or CAAQS are given in Table 4.

Ozone. Over the last five years in San José, NAAQS for 8-hour ozone was exceeded once in 2006. The Bay Area, as a whole, exceeded the 8-hour ozone NAAQS on 0 to 12 days annually and the 8-hour CAAQS on 9 to 22 days (statistics kept since 2005). In San José, the 1-hour State standard for ozone was exceeded on 1 to 5 days annually while that same standard was exceeded on 4 to 19 days annually in the Bay Area as a whole. Most exceedances of ozone standard in the Bay Area occur in downwind portions of the basin, such as Livermore, Concord, and Gilroy.

Carbon Monoxide. Highest carbon monoxide concentrations measured in San José have been well below the national and state ambient standards. Since the primary source of carbon monoxide in is automobiles, highest concentrations would be found near congested roadways that carry large volumes of traffic. Carbon monoxide emitted from a vehicle is highest near the origin of a trip and considerably lower when vehicles are operating in a hot-stabilized mode (usually five to ten minutes into a trip). However, this is different for vehicles of different ages, where older cars require a longer time to reach a hot-stabilized running mode. A vehicle sitting idle for over an hour is normally considered to return to a cold-start mode. Vehicles near the origin of a trip are considered to be in cold-start mode. Vehicle operation on freeways is usually in a hot-stabilized mode so the individual emission rates are much lower than those encountered on arterial roadways leading to the freeway.

TABLE 3 HIGHEST MEASURED AIR POLLUTANT CONCENTRATIONS

Pollutant	Average Time	Measured Air Pollutant Levels				
		2003	**2004**	**2005**	**2006**	**2007**
SAN JOSE						
Ozone (O_3)	1-Hour	**0.12** ppm	0.09 ppm	**0.11** ppm	**0.12** ppm	0.08 ppm
	8-Hour	0.08 ppm	0.07 ppm	0.08 ppm	0.09 ppm	0.07 ppm
Carbon Monoxide (CO)	1-Hour	5.5 ppm	4.4 ppm	4.3 ppm	4.1 ppm	3.5 ppm
	8-Hour	4.0 ppm	3.0 ppm	3.1 ppm	2.9 ppm	2.7 ppm
Nitrogen Dioxide (NO_2)	1-Hour	NA	0.07 ppm	0.07 ppm	0.07 ppm	0.07 ppm
	Annual	NA	NA	0.019 ppm	0.018 ppm	0.017 ppm
Respirable Particulate Matter (PM_{10})	24-Hour	**60 ug/m^3**	**58 ug/m^3**	**54 ug/m^3**	**73 ug/m^3**	**69 ug/m^3**
	Annual	**23 ug/m^3**	**23 ug/m^3**	**22 ug/m^3**	**21 ug/m^3**	**22 ug/m^3**
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	56 ug/m^3	52 ug/m^3	55 ug/m^3	**64 ug/m^3**	**58 ug/m^3**
	Annual	12 ug/m^3	12 ug/m^3	12 ug/m^3	11 ug/m^3	11 ug/m^3
BAY AREA (Basin Summary)						
Ozone (O_3)	1-Hour	**0.12** ppm	**0.11** ppm	**0.12** ppm	**0.12** ppm	**0.12** ppm
	8-Hour	**0.10** ppm	**0.08** ppm	**0.09** ppm	**0.11 ppm**	**0.09 ppm**
Carbon Monoxide (CO)	8-Hour	4.0 ppm	3.4 ppm	3.1 ppm	2.9 ppm	2.7 ppm
Nitrogen Dioxide (NO_2)	1-Hour	0.09 ppm	0.07 ppm	0.07 ppm	0.11 ppm	0.07 ppm
	Annual	0.021ppm	0.019ppm	0.019ppm	0.018ppm	0.017ppm
Respirable Particulate Matter (PM_{10})	1-Hour	**60** ug/m^3	**65** ug/m^3	**81** ug/m^3	**73** ug/m^3	**78** ug/m^3
	Annual	**25** ug/m^3	**26** ug/m^3	**24** ug/m^3	**23** ug/m^3	**26** ug/m^3
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	56 ug/m^3	52 ug/m^3	55 ug/m^3	**75** ug/m^3	**58** ug/m^3
	Annual	12 ug/m^3	12 ug/m^3	12 ug/m^3	11 ug/m^3	11 ug/m^3

Source: BAAQMD, Air Pollution Summaries 2003 - 2007

Note: ppm = parts per million

Values reported in bold exceed ambient air quality standard

NA = data not available

TABLE 4 SUMMARY OF DAYS EXCEEDING AMBIENT AIR QUALITY STANDARDS

Pollutant	Standard	Monitoring Station	Days Exceeding Standard 2003	2004	2005	2006	2007
Ozone (O_3.)	NAAQS 1-hr	San Jose	0	0	X	X	X
		BAY AREA	1	0	X	X	X
	NAAQS 8-hr	San Jose	0	0	0	1	0
		BAY AREA	7	0	1	12	1
	CAAQS 1-hr	San Jose	4	0	1	5	0
		BAY AREA	19	7	9	18	4
	CAAQS 8-hr	San Jose	--	--	1	5	5
		BAY AREA	--	--	9	22	9
Respirable Particulate Matter (PM_{10})	NAAQS 24-hr	San Jose	0	0	0	0	0
		BAY AREA	0	0	0	0	0
	CAAQS 24-hr	San Jose	2	3	2	2	3
		BAY AREA	6	7	6	15	4
Fine Particulate Matter ($PM_{2..5}$)	NAAQS 24-hr	San Jose	0	0	0	6	9
		BAY AREA	0	1	0	10	14
All Other (CO, NO_2, Lead, SO_2)	All Other	San Jose	0	0	0	0	0
		BAY AREA	0	0	0	0	0

Source: BAAQMD, Bay Area Air Pollution Summaries 2003-2007

PM_{10} and $PM_{2.5}$. Measured exceedances of the State PM_{10} standards occurred on 12 separate sampling days over the last five years in San José (two to three times per year). Statistics on the new NAAQS for $PM_{2.5}$ have only been kept since 2006. Fifteen exceedances have occurred in San Jose since then (2006 – 2007). PM_{10} and $PM_{2.5}$ are only measured once every sixth day at the San José monitoring station (most monitoring stations measure particulates every sixth day according to a national schedule). Many stations in the Bay Area reported exceedances of the State standard on the similar fall/winter days as reported in San José. This indicates a regional air quality problem. The primary sources of these pollutants are wood smoke, traffic, and diesel-powered equipment. Meteorological conditions that are common during this time of the year result in calm winds and strong surface-based inversions that trap pollutants near the surface. The buildup of these pollutants is greatest during the evenings and early morning periods. The high levels of PM_{10} and $PM_{2.5}$ result in not only health effects, but also reduced visibility.

Figures 2 and 3 illustrate the sources of PM_{10} and $PM_{2.5}$ during the winter in San José. The data are from the source apportionment analysis conducted by the BAAQMD during two special studies. During the winter in San José high PM concentrations are associated with high levels of wood smoke, primarily from residential wood combustion, and cooking. NOx emitted from mobile and stationary combustion sources, in combination with ammonia, contributes about one-fourth of the PM levels in the form of ammonium nitrate. Particle emissions from mobile and stationary combustion sources are also a major contributor to $PM_{2.5}$. Road dust is a significant contributor to PM_{10}, but not $PM_{2.5}$.

FIGURE 2 PM_{10} SOURCES DURING WINTER IN SAN JOSÉ

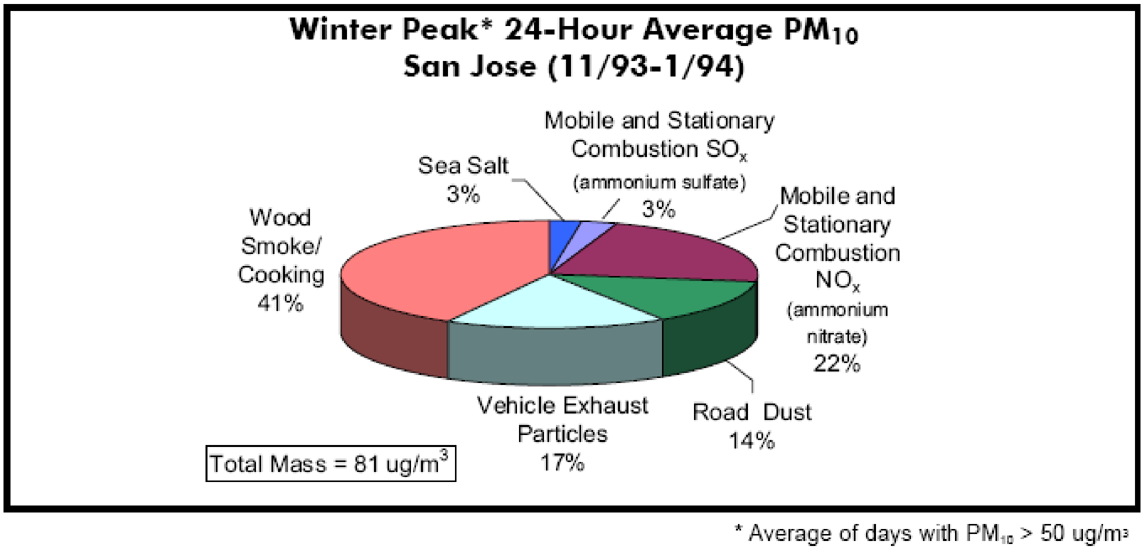
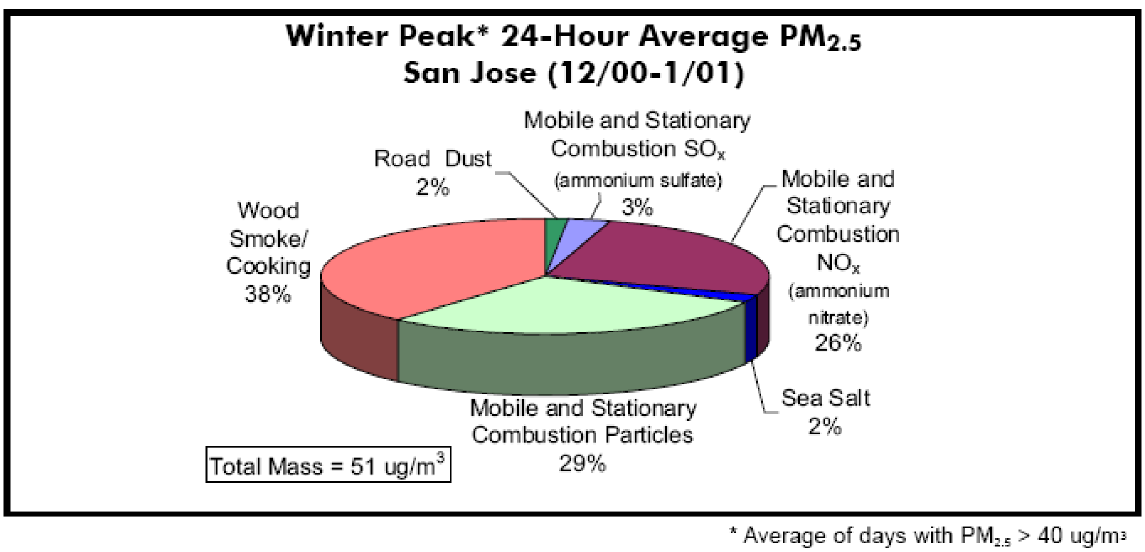


FIGURE 3 $PM_{2.5}$ SOURCES DURING WINTER IN SAN JOSÉ



<u>Other Pollutants.</u> Other criteria pollutants, such as nitrogen dioxide, sulfur dioxide, and lead have always been measured at low levels in San José and should not pose a major air pollution concern in the city.

Toxic Air Contaminants

Concentrations of air toxics throughout the Bay Area are measured by BAAQMD and CARB. Typical compounds measured by BAAQMD include benzene, 1,3-butadiene, carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, methyl tert buytl ether (MTBE), methylene chloride, acetaldehyde, perchloroethylene, toluene, 1,3-butadiene, formaldehyde, and PAH's. Since the ambient concentrations of these toxic air contaminants are very small, they are measured and reported as part per billion (ppb) or nanograms per cubic meter (ng/m^3) on a volume basis. Table 5 contains a summary of the measured concentrations at the Jackson Street monitoring station in San José of the ten compounds posing the greatest known health risk in California. These data are for 2006 for all compounds except for carbon tetrachloride which is for measurements made in 2003. Also included in Table 5 are the overall Bay Area monitoring results for 2006 along with the calculated cancer risk. The information used to develop this table was obtained from the California Air Resources Board 2008 Almanac of Emissions and Air Quality. Risks associated with DPM were calculated for 2000, based on modeling information from CARB. It should be noted that there are no established methods for directly measuring DPM in ambient air.

Table 5 reports concentrations of air toxic contaminants that pose the greatest health risk. The health risk reported in the table reflects only those compounds listed in the table. There may be other significant compounds that are not monitored or may contribute to health risk that are not included. As can be seen from Table 5, the maximum measured toxic air contaminant concentrations in San José are similar or slightly lower than overall Bay Area values.

TABLE 5 SUMMARY OF MOST RECENT MEASURED TOXIC AIR CONTAMINANT CONCENTRATIONS

	Concentration (in ppb)		**Cancer Risk**
Toxic Contaminant	San José 2006	Bay Area 2006	**(chance in one million)** Bay Area
Gaseous TACs - Annual Concentration (in ppb)			
1,3-Butadiene	0.09	0.07	26
Benzene	0.38	0.33	30
Carbon Tetrachloride*	0.10	0.10	25
Formaldehyde	1.88	1.59	12
para-Dichlorobenzene	0.03	0.15	10
Acetaldehyde	0.82	0.66	3
Perchloroethylene	0.03	0.03	1
Methylene Chloride	0.14	0.16	<1
Particulate TACs - Annual Concentration in ng/m^3			
Chromium (hexavalent)	0.05	0.06	9
Diesel Particulate Matter (DPM)	--	--	480.0**
Total for all TACs excluding diesel particulate matter			**116**

Source: (1) Air Resources Board Almanac 2008 - Chapter 5

* Carbon tetrachloride values are for 2003.

** Risk in reported for 2000, but expected to be much lower in 2006.

PPB = parts per billion; ng/m3 = nanograms of contaminant per cubic meter of air

Emissions of the major air toxic contaminants are as follows:

- Diesel particulate matter or DPM: Heavy-duty trucks, buses, construction equipment, and electrical generation. DPM by far makes up the greatest inhalation health risk in the Bay Area.
- 1,3 Butadiene: Primarily on-road motor vehicles. Like carbon monoxide, older model vehicles without adequate catalytic converters have much higher emission rates.
- Benzene: Primarily on-road motor vehicles and gasoline evaporation.
- Carbon tetrachloride: Primary sources of this include chemical and allied product manufacturers and petroleum refineries.
- Formaldehyde and Acetaldehyde: Emitted both directly and indirectly into the atmosphere. It is primarily formed through photochemical oxidation in the atmosphere with elevated levels of ozone and nitrogen oxides. Sources of emissions leading to elevated levels of these compounds are fuel combustion from a variety of mobile and stationary sources. A primary source is from motor vehicle operations.
- para-Dichlorobenzene: Primarily emitted from area-wide sources from consumer products such as non-aerosol insect repellents and solid/gel air fresheners. The CARB adopted an Air Toxics Control Measure in 2004 to prohibit the use of para-dichlorobenzene in products, with a complete ban on sale of products by December 31, 2006.
- Methylene Chloride – Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic fabrication, and as a solvent in paint stripping operations. Paint removers account for the largest use of methylene chloride in California, where methylene chloride is the ingredient in many paint stripping formulations.
- Perchloroethylene: Perchloroethylene is used as a solvent, primarily in dry cleaning operations. It is also used in degreasing operations, paints and coating, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents.

Bay Area cancer risks represents the number of excess cancer cases per million people based on a lifetime exposure (70-year) to the annual average toxic air contaminant concentration in the Bay Area. The cancer risk reported in Table 5 is based on those annual averages reported and changes from year-to-year based on current monitoring results. CARB published maps showing the 2001 total inhalation health risk in the State. According to these maps, the health risk in San José ranged from above 500 to above 750 case per million, which is above the average for the Bay Area (see Figure 4) . More densely urban areas, such as San Francisco, Oakland and San José have higher risks of up to 1,000 in a million. With all diesel risk reduction measures implemented, CARB predicts that the overall inhalation health risk in San José would decrease to less than 500 cases per million by 2010 (see Figure 4). It is important to note the following regarding air toxic contaminants: (1) The health risks are based on the average concentration for the entire region and the health risk at individual locations will vary considerably; and (2) since 1990, average concentrations of toxic air contaminants and the associated health risks have been reduced (by 50 percent or more for many compounds).

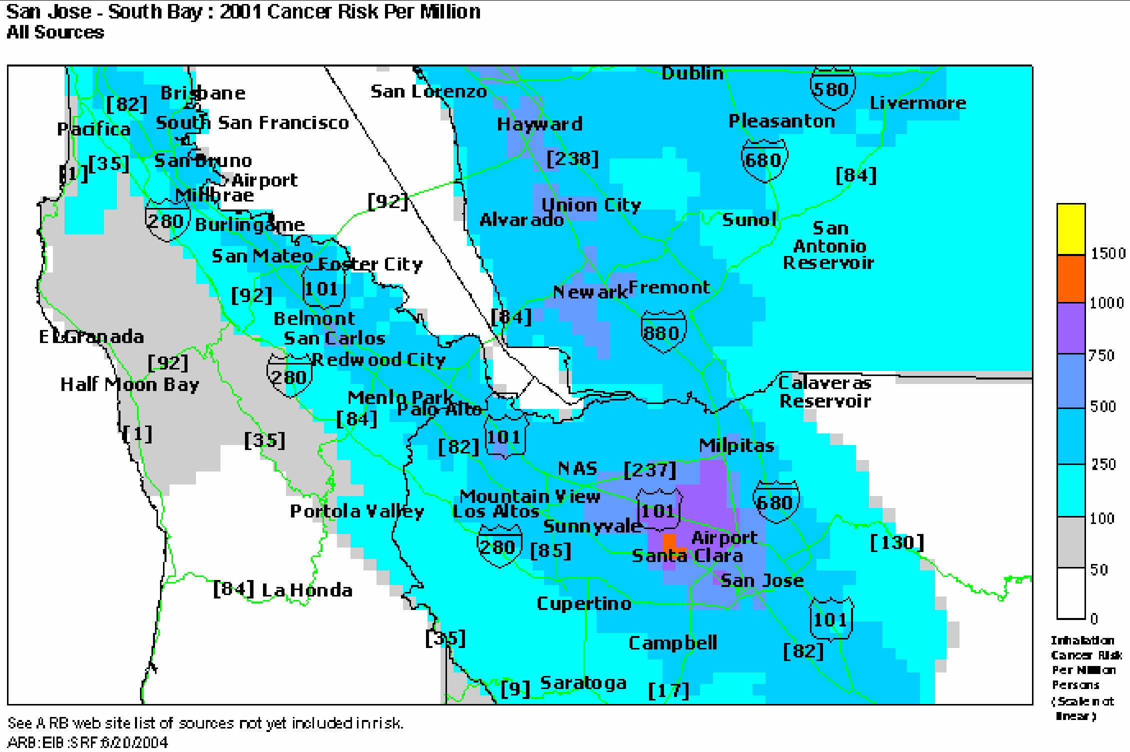
Attainment Status

Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. Areas that do not violate ambient air quality standards are considered to have attained the standard. The Bay Area as a whole does not meet State or federal ambient air quality standards for ground level ozone and State standards for PM_{10} and $PM_{2.5}$. Table 6 describes the current attainment status of the Bay Area and San Jose with respect to the NAAQS and CAAQS.

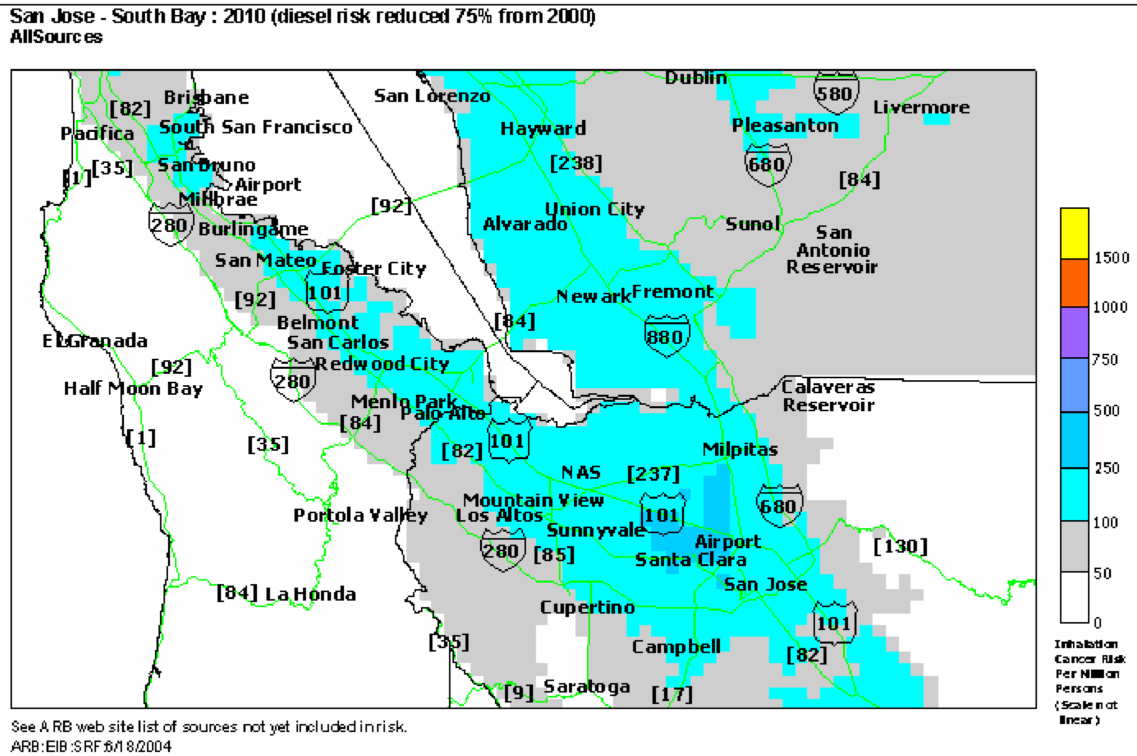
Under the Federal CAA, the U.S. EPA has classified the region as marginally nonattainment for the 8-hour ozone standard. EPA required the region to attain the standard by 2007. U.S. EPA has determined that the Bay Area has met this standard, but a formal redesignation request and maintenance plan would have to be submitted before redesignation could be made. In May 2008, U.S. EPA lowered the 8-hour ozone standard from 0.08 to 0.075 ppm. Final designations based upon the new 0.075 ppm standard will be made by March 2010. The BAAQMD is not likely to make a redesignation request for the older standard since that will be revoked after designations are made with the newer standard. The U.S. EPA recently designated the region as nonattainment for the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ as recent monitoring data indicate levels above the standard in San José and Vallejo. The U.S. EPA's action designated the entire Bay Area air basin nonattainment for the standard. The region has until 2012 to develop a plan to attain the standard and until 2014 to attain the standard. The Bay Area has met the CO standards for over a decade and is classified attainment maintenance by the US EPA. The US EPA grades the region unclassified for all other air pollutants, which include PM_{10}.

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

FIGURE 4 MAPS SHOWING TOTAL ESTIMATED CANCER RISK IN SOUTH BAY AREA



2001 Estimated Cancer Risk



2010 Estimated Cancer Risk with Implementation of Diesel Risk Reduction Measures

TABLE 6 ATTAINMENT STATUS FOR BAY AREA AND SAN JOSÉ

Pollutant	Federal Status	State Status
Ozone (O_3) – 1-Hour Standard	Not Applicable	Serious Nonattainment
Ozone (O_3) – 8-Hour Standard	Marginal Nonattainment	Nonattainment
Ozone (O_3) – 1-Hour Standard	--	Serious Nonattainment
Respirable Particulate Matter (PM_{10}) 24-hour Standard	Unclassifiable/Attainment	Nonattainment
Respirable Particulate Matter (PM_{10}) Annual Standard	--	Nonattainment
Fine Particulate Matter ($PM_{2.5}$) 24-hour Standard	Nonattainment (effective in 2009)[1]	Not Applicable
Fine Particulate Matter ($PM_{2.5}$) Annual Standard	Attainment	Nonattainment
Carbon Monoxide (CO) 8-Hour Standard	Attainment/Maintenance	Attainment
Carbon Monoxide (CO) 1-Hour Standard	Attainment	Attainment
Nitrogen Dioxide (No_2) 1-Hour Standard	--	Attainment
Nitrogen Dioxide (No_2) 24-Hour Standard	Attainment	--
Sulfur Dioxide (SO_2)	Attainment	Attainment
Sulfates	--	Attainment
Lead	--	Attainment
Hydrogen Sulfide	--	Unclassified
Visibility Reducing Particles	--	Unclassified

[1] Note that the attainment designations were made in December 2008 under President Bush. Subsequently, President Obama ordered a freeze on all pending federal rules; therefore, the effective date of the designation is unknown at this time.

Existing Sources of Air Pollution

Sources of air pollution in and around San José are primarily traffic or on-road vehicles. Emissions inventories are updated for each county by CARB. Table 7 summarizes emissions for Santa Clara County and the Bay Area. Traffic accounts for about 40 to 50 percent of the emissions of ozone precursor pollutants (NOx and ROG). Area wide sources, which include construction activities, residential wood smoke, off-road travel, and agriculture, account for the greatest portion of PM_{10} emissions (about 80 percent). These sources account for over 50 percent of the $PM_{2.5}$ emissions. However, $PM_{2.5}$ is also formed from reactions of NOx and other gaseous air pollutants in the atmosphere.

TABLE 7 2006 AIR POLLUTANT EMISSIONS INVENTORY FOR OZONE PRECURSORS AND PARTICULATE MATTER

	Emissions (tons per day)			
	ROG	**NOx**	**PM_{10*}**	**$PM_{2.5}$**
SANTA CLARA COUNTY				
Stationary Source	11.84	8.82	2.73	1.83
Area-Wide Sources	21.36	4.59	43.58	11.58
Mobile Sources –- On-Road	31.00	51.07	2.40	1.68
Mobile Sources –- Off-Road	15.19	34.27	1.85	1.67
TOTAL (rounded)	81.05	98.75	50.55	16.76
BAY AREA				
Stationary Source	7.30	47.60	15.30	11.40
Area-Wide Sources	88.00	19.70	176.10	53.0
Mobile Sources –- On-Road	128.40	233.70	10.40	7.40
Mobile Sources –- Off-Road	79.40	191.10	11.10	9.90
TOTAL (rounded)	369.20	492.00	212.80	81.70

* PM_{10} includes $PM_{2.5}$

Source: California Air Resources Board (http://www.arb.ca.gov/ei/emissiondata.htm)

Mobile sources of air pollution make up a large portion of the emissions inventory for Santa Clara County. Mobile sources include traffic, boats, construction equipment, trains, and aircraft. Approximately 57 percent of the ROG and 86 percent of the NOx emitted in Santa Clara County are from mobile sources resulting primarily from traffic.

In recent years the City of San José and the Mineta San José International Airport (Airport) have implemented programs and infrastructure to reduce vehicle emissions. As part of the City's Green Vision, one of the 15-year goals is to ensure that 100 percent of public fleet vehicles run on alternative fuels. In 2007, 36 percent of the City's vehicles and equipment operated on alternative fuels. In 2003, a compressed natural gas (CNG) fueling station was opened at the Airport. The station was developed primarily for vehicles servicing the airport, but is also open to the public. The Airport has converted its entire bus fleet of airport shuttles from diesel to CNG, and about 25 percent of the Airport's fleet of vehicles are now using CNG. The Airport also has an Alternative Fuels Program (AFP) that provides incentives to tenants to convert their vehicles to CNG or other alternative, cleaner burning vehicles.

Stationary Sources

Excluding gas stations, dry cleaning facilities, print shops, and auto repair shops, CARB's emission inventory database (http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php) of stationary sources for 2006 lists about 450 facilities throughout San José.

There are also about 80 dry cleaner operations, many of which emit perchlorethylene, a solvent commonly used for dry cleaning. The largest stationary sources in San José, with emissions greater than 10 tons per year, are listed in Table 8. The largest stationary sources in San José are the SFPP[4], LP petroleum terminal facility (ROG), the San José/Santa Clara Water Pollution control facility (NOx) and Guadalupe Rubbish Disposal (PM_{10}). These individual sources not only generate emissions directly from the facilities but also from truck traffic associated with their operations. The locations of larger stationary air pollutant sources in San José are shown in Figure 5.

Toxic Air Contaminants

Emissions of toxic air contaminants from stationary sources in San José can be found in the most recent version of BAAQMD's annual Toxic Contaminant Control Report (see website http://www.baaqmd.gov/pmt/air_toxics/annual_reports/index.htm). A majority of these sources are dry cleaning facilities, which emit perchloroethylene. However, the most prevalent toxic contaminants in San José and Santa Clara County (excluding diesel particulate matter) are benzene and 1,3-Butadiene from mobile sources and formaldehyde that comes from a variety of sources. Other sources of toxic air contaminants include sanitary districts or landfills and manufacturing facilities. Table 9 summarizes the emissions of the top ten compounds causing the greatest health risk in the state for the Bay Area and Santa Clara County.

TABLE 8 SAN JOSE EMISSION SOURCES WITH MORE THAN 10 TONS PER YEAR OF ROG, NOX OR PM10

Facility Name	Address	ROG	NOx	PM_{10}
SFPP, LP	2150 Kruse Drive	46.8	0.0	0.0
Chevron Products Company	1020 Berryessa Street	36.3	0.0	0.0
Hubbell Lenoir City Inc	615 N King Road	28.4	0.0	0.1
San José/Santa Clara Water Pollution	700 Los Esteros Road	25.3	135.3	8.8
Mitico Metal Finishers, LLC	1291 Old Oakland Rd	20.4	0.0	0.0
Hitachi Global Storage Technology	5600 Cottle Road	16.8	9.2	1.2
City Of San José (Singleton Rd)	885 Singleton Road	14.4	3.7	0.6
Coast Oil Company	2075 Alum Rock Ave	12.0	0.0	0.0
Guadalupe Rubbish Disposal	15999 Guadalupe Mines Rd	11.8	1.3	19.0
Philips Lumileds Lighting, Inc	370 W Trimble Road	11.0	1.3	0.2
Gas Recovery Systems, Inc	1804 Dixon Landing Rd	0.2	111.0	4.7
Gas Recovery Systems, Inc	15999 Guadalupe Mines Rd	0.1	69.3	2.2
San Jose State University (Cogen Plant)	San Carlos Street	0.8	38.3	3.0
O L S Energy-Agnews	3530 Zanker Road	2.6	29.9	11.5
Los Esteros Critical Energy Fa	800 Thomas Foon Chew Way	4.8	22.5	17.4
Santa Clara Valley Health & Hospital	751 So Bascom Avenue	0.4	14.5	0.4
Zanker Road Resource Management	705 Los Esteros Road	3.4	10.2	5.2
Zanker Road Material Processing	675 Los Esteros Road	1.1	0.7	16.5

Source: Air Resources Board 2008

[4] SFPP, L.P. is an operating partnership of Kinder Morgan Energy Partners L.P. that owns and operates a petroleum terminal facility, which transfers and stores piped petroleum products from refineries.

TABLE 9 2006 TOXIC AIR CONTAMINANT EMISSIONS INVENTORY (IN TONS PER YEAR)

Toxic Air Contaminant	Bay Area	Santa Clara County
Acetaldehyde	1,521	298
Benzene	1,836	395
1,3-Butadiene	394	78
Carbon Tetrachloride	0.94	< 0.01
Chromium, Hexavalent	0.08	0.02
para-Dichlorobenzene	279	71
Formaldehyde	3,488	682
Methylene Chloride	963	265
Perchloroethylene	709	172
Diesel Particulate Matter	4,697	863

Source: Air Resources Board Almanac 2008

<u>Dust</u>

Construction and vehicle travel result in the generation of dust, which leads to elevated PM_{10} levels in the region. Dust from construction activities can affect nearby active land uses. Activities that generate visible dust clouds extending beyond their boundaries are a source of air pollution that can be controlled.

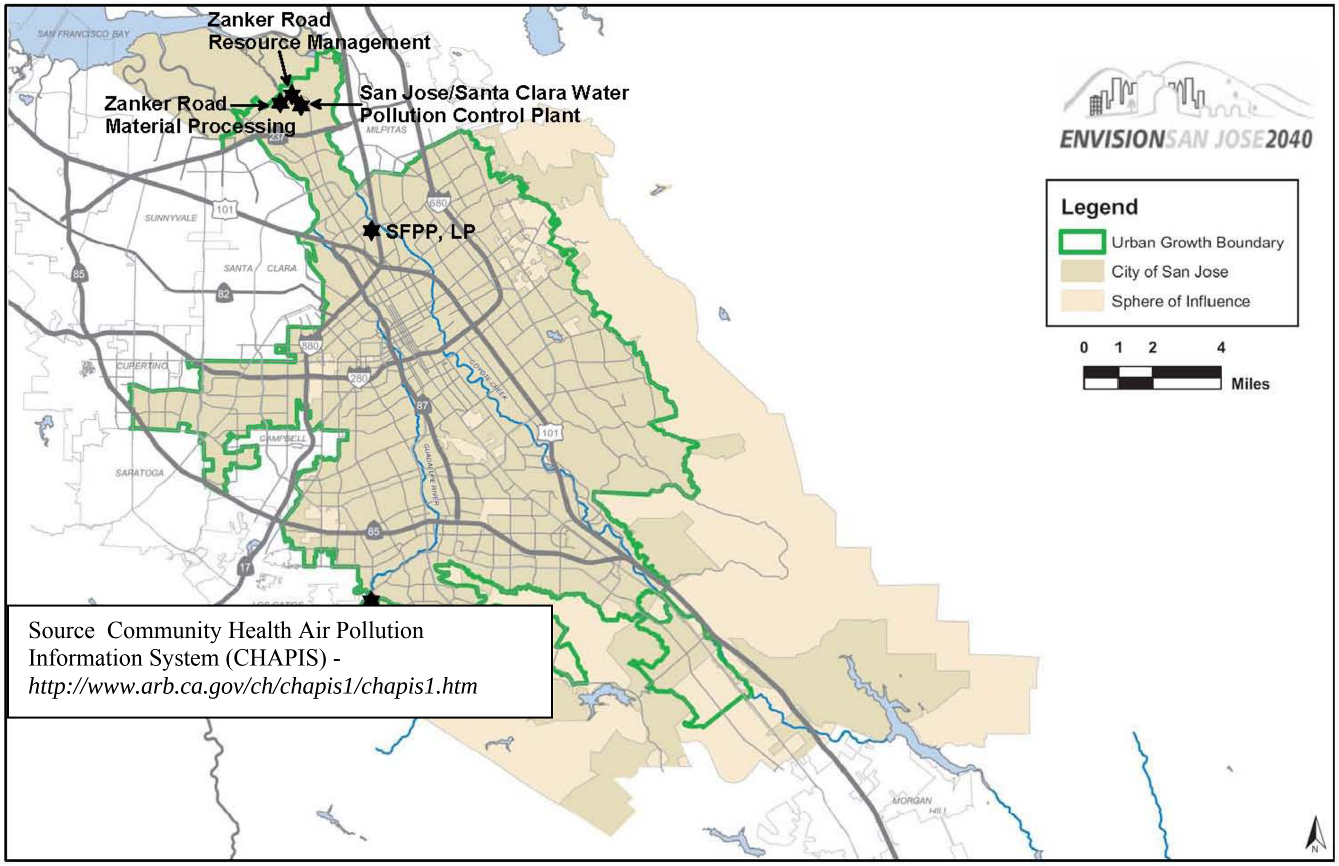
<u>Odors</u>

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 facility from BAAQMD. Typical large sources of odors that result in complaints are wastewater treatment facilities, landfills, food processing facilities and agricultural operations. Other sources typically result in very localized sources of odors. Locations of odor sources in San José are also shown in Figure 5.

Sensitive Receptors

Sensitive receptors include hospitals, schools, playgrounds, childcare facilities, and convalescent facilities. BAAQMD considers residences to also be sensitive receptors. In the past, maps have been developed that show locations of schools, hospitals, and convalescence homes to represent sensitive receivers. These maps are not particularly useful since air quality standards are applicable to all areas and not just sensitive receptors. Many people who are susceptible to air pollution (e.g., asthmatics) also reside in residences. Both State and National ambient air quality standards were developed with intent to protect sensitive receptors from the adverse impacts of air pollution.

FIGURE 5 LOCATIONS OF LARGE STATIONARY AIR POLLUTANT SOURCES AND POTENTIAL SOURCES OF ODORS



Source Community Health Air Pollution Information System (CHAPIS) - *http://www.arb.ca.gov/ch/chapis1/chapis1.htm*

V AIR QUALITY TRENDS

Efforts to reduce air pollutant levels are aimed primarily at reducing emissions from various sources. Other efforts, such as programs like *Spare the Air*, are aimed at temporarily reducing emissions when weather forecasts indicate the potential for elevated air pollutant levels. BAAQMD, along with CARB, conduct detailed computer modeling of ozone levels both in the Bay Area and levels transported to other areas. The modeling is a large effort used to identify sources of air pollution to further reduce. The modeling is also conducted to predict attainment of air quality standards. Results of these studies are the basis of current air quality regulations and plans.

Table 10 shows the trend in the emission inventory for the Bay Area since 1975. Emissions of ozone precursors have decreased considerably over the last 15 years. During the past 10 years, these emissions have decreased by 30 to 40 percent. Figure 6 shows that, although ozone precursor emissions decreased substantially, the effect on ozone levels is subtle. However, the trend toward lower ozone levels has been fairly consistent for the last 20 years. In fact, the downward trend appears to have been sufficient to show attainment of NAAQS for ozone. Ozone precursor emissions are projected to decrease by 25 to 40 percent over the next 15 years, while population and vehicle use increases. The reductions are the result of rules and regulations that are or will be implemented over the future. For instance, new vehicle standards require time to reduce emissions as the population of vehicles ages where older, more polluting vehicles are retired.

TABLE 10 TREND IN BAY AREA AIR BASIN EMISSIONS (ANNUAL AVERAGE IN TONS PER DAY)

	Emissions (tons/day, annual average)									
Pollutant	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
Nox	943	918	821	797	720	622	496	423	348	301
ROG	1430	1320	1047	764	646	525	382	330	302	290
PM_{10}	181	182	195	194	189	218	210	220	230	241
$PM_{2.5}$	81	79	79	83	81	84	81	83	84	87
Sox	210	196	106	109	67	64	58	57	62	68
CO	9075	8334	7011	5325	3917	2961	2041	1617	1363	1230

PM_{10} emissions have increased by about 10 percent over the last 10 years and are anticipated to increase by another 9 percent over the next 10 years. The trend in $PM_{2.5}$ has been subtler, since $PM_{2.5}$ is primarily a by-product of combustion. Large sources of PM_{10} emissions are area sources that are difficult to control. The past trends in PM_{10} and $PM_{2.5}$ concentrations are shown in Figures 7 and 8, respectively. PM_{10} concentrations in the Bay Area have remained almost unchanged during the past 10 years. Although PM_{10}

emissions are expected to increase slightly, some additional reductions in PM_{10} concentrations are expected. Many of the sources that contribute to ozone formation also lead to PM_{10} and $PM_{2.5}$ formation through chemical reactions in the atmosphere. For example, NOx contributes to ammonium nitrate formation in the atmosphere that makes up over 20 percent of the PM_{10} and $PM_{2.5}$ composition on the days with highest levels in San José (see Figure 3). These secondary particulates contribute to overall PM_{10} and $PM_{2.5}$ concentrations. NOx emissions are expected to decrease substantially in the future. Wood smoke is a major contributor to elevated PM_{10} and $PM_{2.5}$ levels in San Jose. New rules prohibiting wood burning on days when high particulate levels are expected to also reduce both $PM_{2.5}$ and PM_{10} concentrations.

FIGURE 6 RECENT 20-YEAR TREND IN BAY AREA OZONE LEVELS

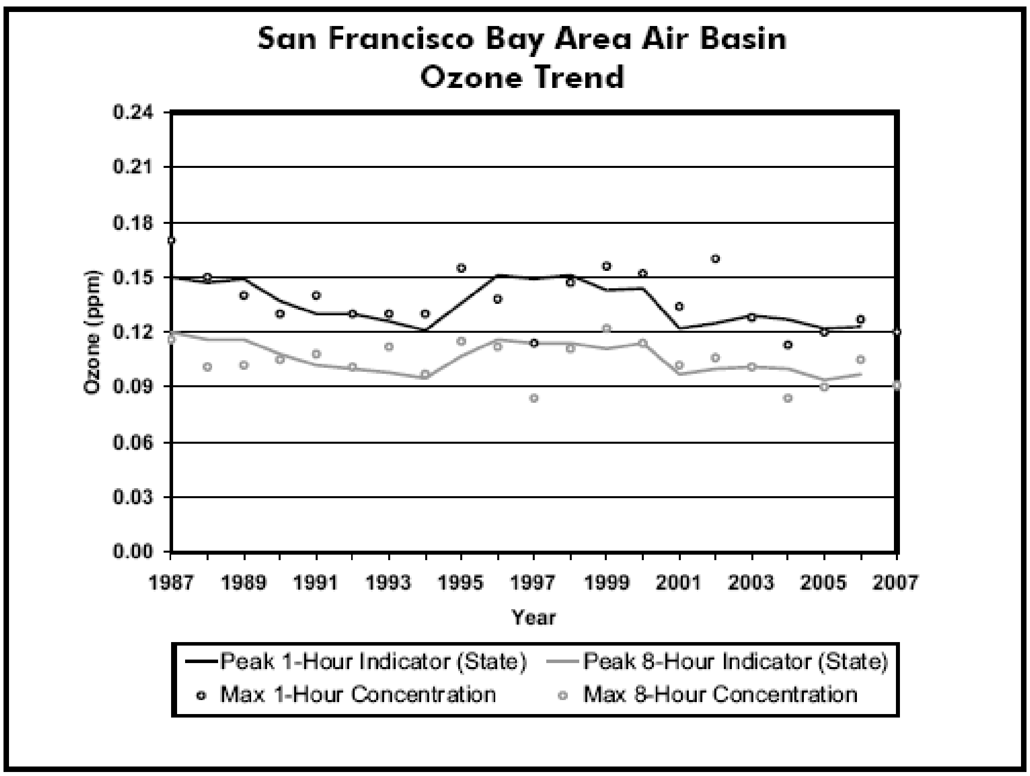


FIGURE 7 RECENT TREND IN BAY AREA ANNUAL PM_{10} LEVELS

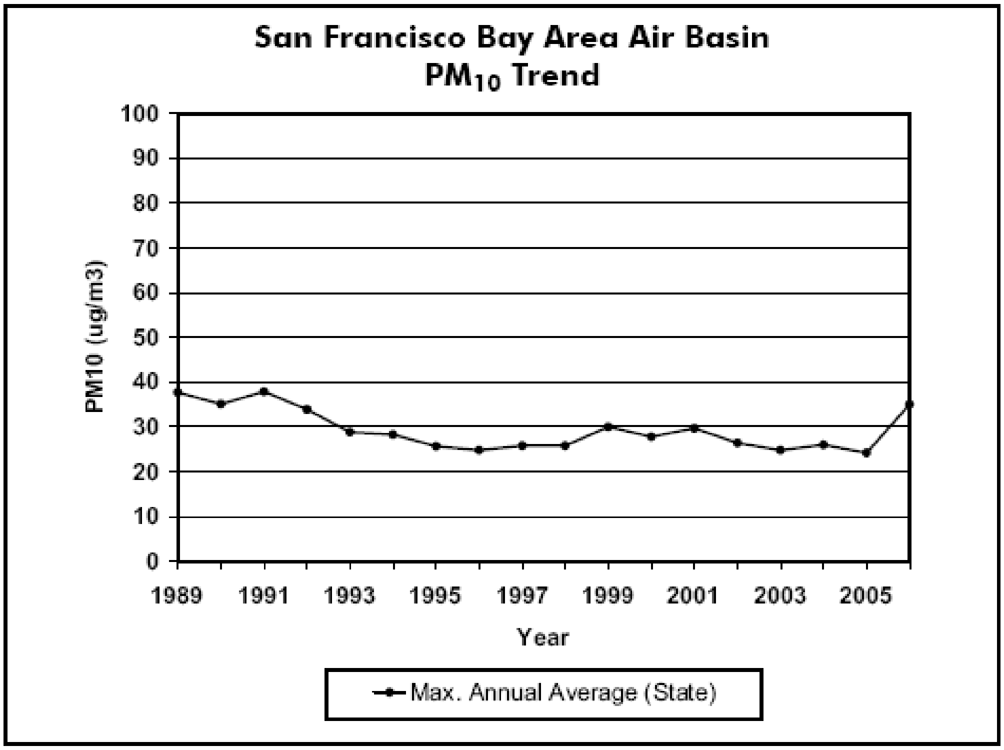
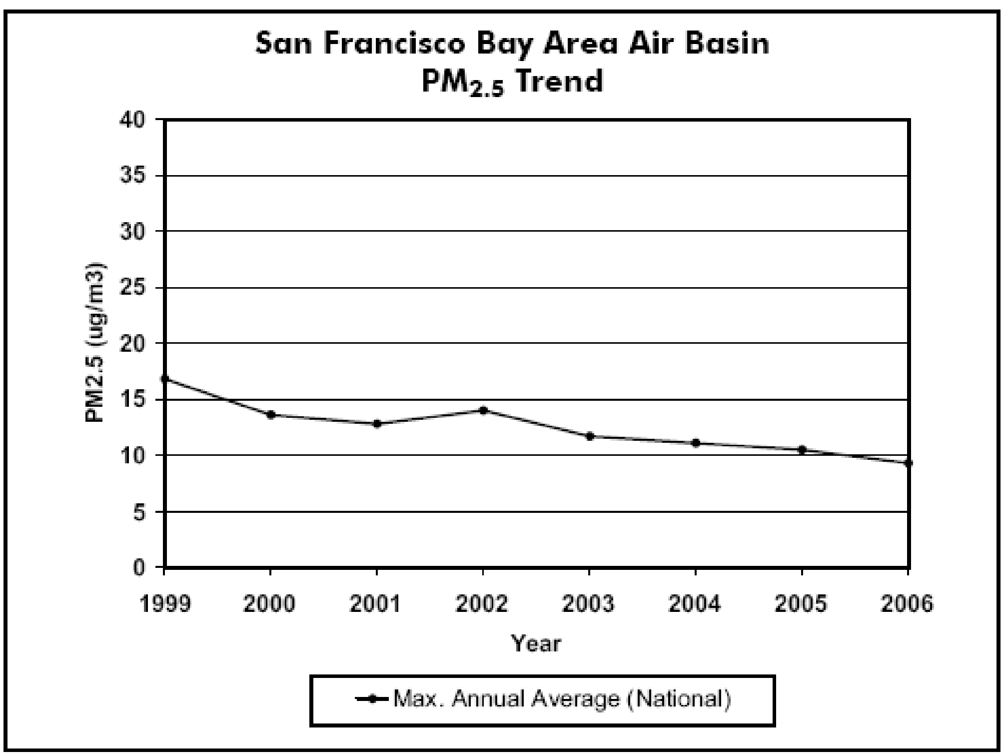


FIGURE 8 RECENT TREND IN BAY AREA ANNUAL $PM_{2.5}$ LEVELS



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Appendix D-2

Odor Complaints

Citywide Odor Complaints in San José
2007-2009

Source: **Bay Area Air Quality Management District**
Rochelle Henderson, Public Records Coordinator
August 11, 2010

Complaint #	Type	Description	Occur @	Site Name	Address	City	Status
200688	ODR	carpet cleaner	07/11/08	SFD	1000 Villa Ave #89	San Jose	Unconfirmed
205277	ODR	petroleum/chemical	08/16/09	Chevron Products Company	1020 Berryessa Road	San Jose	Unconfirmed
205346	ODR	strong petro	08/25/09	Chevron Products Company	1020 Berryessa Road	San Jose	Unconfirmed
204273	ODR	burns trash/plastic	04/04/09	San Jose State University F	1036 So 5th St	San Jose	Unconfirmed
201641	ODR	something dead	10/21/08	SFD	1149 Palm St	San Jose	Unconfirmed
201540	ODR	foul	10/14/08	American Metal & Iron	11665 Berryessa Rd	San Jose	Unconfirmed
201614	ODR	bad chemical	10/17/08	american metal & iron	11665 berryessa rd	San Jose	Unconfirmed
199931	ODR	burnt concrete	04/01/08	Granite Rock	11711 Berryessa Road	San Jose	Unconfirmed
207234	ODR	really bad gas	07/12/10	Granite Rock	11711 Berryessa Road	San Jose	Unconfirmed
206401	ODR	spray paiinting	02/03/10	Autobody Shop	1172 Lick Ave	San Jose	Unconfirmed
206683	ODR	very bad paint	03/31/10	NONE	1172 Lick Ave	San Jose	Unconfirmed
207223	ODR	paint	07/09/10	formerly D&J Spray Paint	1172 Lick Ave	San Jose	Unconfirmed
207376	ODR	paint	08/05/10	formerly D&J Spray Paint	1172 Lick Ave	San Jose	Unconfirmed
200388	ODR	rotting flesh	06/04/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200468	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200469	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200470	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200474	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200475	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200476	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200477	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200478	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200479	ODR	rotting meat	06/14/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200484	ODR	rotting meat	06/15/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200538	ODR	rotting meat	06/21/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200567	ODR	decomposing	06/25/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200572	ODR	body decomp	06/26/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Confirmed
200580	ODR	decomp	06/27/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Confirmed
200588	ODR	dead animal	06/28/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200591	ODR	rancid meat	06/28/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200593	ODR	dead animal	06/28/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200594	ODR	dead dogs	06/29/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200595	ODR	dead animals	06/29/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200683	ODR	something died	07/11/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200689	ODR	rotting meat	07/12/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200694	ODR	dead animal	07/13/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed

200755	ODR	noxious	07/22/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200886	ODR	burning hair	08/09/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200959	ODR	rotting meat	08/16/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200960	ODR	dead animal	08/16/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200961	ODR	dead animal	08/16/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200966	ODR	dead animal	08/17/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200967	ODR	rotting meat	08/17/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200968	ODR	dead animal	08/17/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
200969	ODR	dead animal	08/17/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201117	ODR	rotting meat	08/31/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201118	ODR	rotting meat	08/31/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201119	ODR	rotting meat	08/31/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201218	ODR	rotting meat	09/13/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201219	ODR	rotting meat	09/13/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201429	ODR	rotting meat	10/05/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201430	ODR	rotting meat	10/05/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201431	ODR	dead body	10/05/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
201432	ODR	rotting meat	10/05/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
202390	ODR	dead animals	12/06/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
202396	ODR	rotting meat	12/06/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
202670	ODR	rancid burnt handle	12/11/08	San Jose Tallow Company	11740 Berryesa Road	San Jose	Confirmed
204012	ODR	rancid oil/feces	03/07/09	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
204183	ODR	like a crematorium	03/21/09	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
204482	ODR	none given	04/25/09	San Jose Tallow Company	11740 Berryesa Road	San Jose	Unconfirmed
205219	ODR	rotting meat	08/09/08	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
204859	ODR	rancid oil	06/20/09	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
205316	ODR	crematorium	08/23/09	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
205473	ODR	dead animals	09/11/09	San Jose Tallow Co	11740 Berryessa Road	San Jose	Confirmed
205478	ODR	dead animals	09/13/09	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
205479	ODR		09/13/09	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
205538	ODR	death	09/19/09	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
206619	ODR	rancid meat	03/20/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
206660	ODR	rotting meat	03/27/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
206667	ODR	rotting meat	03/28/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
206682	ODR	rancid meat	03/31/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Confirmed
206724	ODR	rotting meat	04/10/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
206769	ODR	bad	04/18/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed

206835	ODR	rancid grease	05/02/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
207111	ODR	rancid oil	06/20/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
207113	ODR	rotting meat	06/20/10	San Jose Tallow Co	11740 Berryessa Road	San Jose	Unconfirmed
205816	ODR	paint	10/13/09	Tron's Auto Body & Paint Sh	1190 N 13th St #30	San Jose	Unconfirmed
197796	ODR	paint	07/17/07	Genesis Auto Body & Paint	1190 N 13th St, Unit A	San Jose	Unconfirmed
198010	ODR	spray painting	08/10/07	Genesis Auto Body & Paint	1190 N 13th St, Unit A	San Jose	Unconfirmed
198636	ODR	paint	10/22/07	Genesis Auto Body & Paint	1190 N 13th St, Unit A	San Jose	Unconfirmed
199269	ODR	bad fumes	01/14/08	Genesis Auto Body & Paint	1190 N 13th St, Unit A	San Jose	Unconfirmed
199367	ODR	spray paint	01/26/08	Genesis Auto Body & Paint	1190 N 13th St, Unit A	San Jose	Unconfirmed
200134	ODR	paint	04/29/08	Genesis Auto Body & Paint	1190 N 13th St, Unit A	San Jose	Unconfirmed
205317	ODR	paint fumes	08/22/09	Genesis Auto Body & Paint	1190 N 13th St, Unit A	San Jose	Unconfirmed
199206	ODR	spray paintng	01/04/08	Autobody Shop	1190 North 13th St	San Jose	Unconfirmed
205296	ODR	paint fumes	08/20/09	SFD	1198 Krebs Ct	San Jose	Confirmed
204839	ODR	paint	05/22/09	Sunset Autobody & Collisior	13 North Sunset Ave	San Jose	Unconfirmed
199732	ODR	sewage	03/07/08	SFD	1343 University Ave	San Jose	Unconfirmed
198677	ODR	paint	10/24/07	SFD	14990 Freeman	San Jose	Unconfirmed
200984	ODR	urine & feces	08/20/08	Construction Site	1523 W San Carlos	San Jose	Unconfirmed
200495	ODR	sewer	06/16/08	San Jose Flea Market	1590 Berryessa Rd	San Jose	Unconfirmed
199313	ODR	greenwaste	01/18/08	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
199489	ODR	burning smell	02/13/08	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
199752	ODR	terrible	03/10/08	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
199849	ODR	burnt	03/21/08	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
199876	ODR	terrible	03/24/08	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
204354	ODR	bad	04/08/08	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
200510	ODR	strong foul	06/18/08	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
204133	ODR	sweet	03/19/09	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
204177	ODR	bad	03/21/09	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
204195	ODR	bad	03/24/09	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
204683	ODR	compost	05/21/09	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
206325	ODR	composting	01/14/10	Guadalupe Rubbish Disposa	15999 Guadalupe Mines Rd	San Jose	Unconfirmed
198991	ODR	diesel exhaust	11/28/07	Amberwood gardens Skilled	1601 Petersen Ave	San Jose	Unconfirmed
200090	ODR	glue	02/23/08	Commercial seating speciali	1701 Rodgers Ave Unit E, A	San Jose	Unconfirmed
198722	ODR	paint	10/31/07	Clear Oak Designs	1723 Rogers Avenue, #B	San Jose	Unconfirmed
204710	ODR	bad	05/27/09	Mi Pueblo Food Center	1745 Story Rd #4	San Jose	Unconfirmed
204760	ODR	bad	06/03/09	Mi Pueblo Food Center	1745 Story Rd #4	San Jose	Unconfirmed
205992	ODR	paint	11/04/09	Auto Palace	1798 West San Carlos	San Jose	Unconfirmed
204608	ODR		05/06/09	SFD	2080 Marlboro Ct	San Jose	Unconfirmed

204487	ODR	garbage unsanitary	04/25/09	MFD	2112 Monterey Hwy	San Jose	Unconfirmed
204782	ODR	metal	06/05/09	SFD	2150 Monterey Rd	San Jose	Unconfirmed
204840	ODR	welding	06/16/09	Peppertree Mobile Home Pa	2150 Monterey Rd	San Jose	Unconfirmed
206243	ODR	sewer	12/28/09	SFD	2335 Ribbs Lane	San Jose	Unconfirmed
197778	ODR	chemical, mildew	07/16/07	Good Samaritan Hospital	2425 Samaritan Drive	San Jose	Unconfirmed
199864	ODR	garbage	03/22/08	SFD	2550 Sue Ave	San Jose	Unconfirmed
203986	ODR	burning trash	03/05/09	SFD	2756 Westberry Dr	San Jose	Unconfirmed
198233	ODR	disinfectant	09/05/07	SFD	2962 ALMOND Drive	San Jose	Unconfirmed
198703	ODR	dryer sheet	10/26/07	Nursing Home	2962 Almond Drive	San Jose	Unconfirmed
202031	ODR	chemical	11/20/08	Larochelle (recycle co.)	3000 Aborn Road	San Jose	Unconfirmed
197961	ODR	spray painting cars	08/04/07	SFD	3337 Lucky Dr	San Jose	Unconfirmed
198130	ODR	spray painting cars	08/24/07	SFD	3337 Lucky Dr	San Jose	Unconfirmed
200013	ODR	paint	04/11/08	SFD	3337 Lucky Dr	San Jose	Unconfirmed
206126	ODR	tar fumes	11/25/09	SFD	346 Meadow Ln	San Jose	Unconfirmed
197764	ODR	burning plastic	07/13/07	SFD	351 North 17th St	San Jose	Unconfirmed
200650	ODR	paint thinner	07/08/08	Woodworking Shop	354 Umbarger Rd Ste 8	San Jose	Unconfirmed
198511	ODR	spray paint	10/05/07	Enterprise Rent-a-car	3635 Pearl Ave	San Jose	Unconfirmed
205858	ODR	paint fumes	10/19/09	Sony Van Auto body	374 Phelan Ave	San Jose	Unconfirmed
203901	ODR	heavy smoke	02/25/09	Region Supermarket	400 S King Rd	San Jose	Unconfirmed
205570	ODR	paint fumes	09/16/09	SFD	424 Century Oaks Way	San Jose	Unconfirmed
206498	ODR	spray paint	02/27/10	SFD	4263 Vista Park Dr	San Jose	Unconfirmed
197931	ODR	dead fish/trash	08/02/07	Empty Pond	4271 N 1st st	San Jose	Unconfirmed
199866	ODR	chemical	03/22/08	MFD	4691 Norwalk Dr	San Jose	Unconfirmed
199484	ODR	chemical	02/12/08	SFD	4761 Cherrywood	San Jose	Unconfirmed
200060	ODR	pungent	04/17/08	SFD	4761 Cherrywood	San Jose	Confirmed
201778	ODR	paint fumes	10/31/08	Miracle Auto Painting	495 E Brokaw Road	San Jose	Unconfirmed
200649	ODR	ammonia	07/08/08	NONE	500 Block of Taylor	San Jose	Unconfirmed
205271	ODR	fecal small	08/15/09	SFD	5087 Maitland Dr	San Jose	Unconfirmed
205294	ODR	bad	08/19/09	SFD	5087 Maitland Dr	San Jose	Unconfirmed
205311	ODR	bad	08/21/09	SFD	5087 Maitland Dr	San Jose	Unconfirmed
207066	ODR	fecal matter	06/13/10	SFD	5087 Maitland Dr	San Jose	Confirmed
204256	ODR	paint fumes	04/02/09	New United Auto Body	520 N 7th Street	San Jose	Unconfirmed
205143	ODR	paint	07/29/09	Finish Line, Inc	536 Stockton Avenue	San Jose	Unconfirmed
200390	ODR	sewage	06/04/08	SFD	5547 Dunsbury Ct	San Jose	Confirmed
204250	ODR	toxic fumes	04/02/09	Fedor Wallcovering	566 Emory St	San Jose	Unconfirmed
199281	ODR	chemical	01/15/08	SFD	5969 Vista Loop	San Jose	Unconfirmed
205608	ODR	spray painting	09/25/09	MAACO	600 Stockton Avenue	San Jose	Unconfirmed

202745	ODR	strong fumes	12/15/08	Petro America	602 So Winchester Blvd	San Jose	Confirmed
207207	ODR	paint	07/07/10	SFD	6130 Monterey Rd Space 62	San Jose	Unconfirmed
201649	ODR	tar	10/22/08	Santa Teresa High School	6150 Snell Ave	San Jose	Unconfirmed
203832	ODR	paint	01/18/09	A & M Paint & Body Shop	633 N 13th Street	San Jose	Unconfirmed
203053	ODR	brng coal	01/05/09	SFD	645 Mohican Dr	San Jose	Unconfirmed
204669	ODR	horrible rotten	05/19/09	SFD	6457 Camellia Dr	San Jose	Unconfirmed
198200	ODR	very strong	09/01/07	San Jose/Santa Clara Water	700 Los Esteros Road	San Jose	Unconfirmed
200775	ODR	urine	07/25/08	San Jose/Santa Clara Water	700 Los Esteros Road	San Jose	Unconfirmed
205769	ODR	sewage	10/06/09	San Jose/Santa Clara Water	700 Los Esteros Road	San Jose	Unconfirmed
206854	ODR	paint	05/04/10	Auzerais Collision Center	755 Auzerais Ave	San Jose	Unconfirmed
200860	ODR	acrid burning	08/04/08	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
201148	ODR	burnt popcorn	09/04/08	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
201194	ODR	burning green beans	09/09/08	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
201228	ODR	bad	09/14/08	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
201961	ODR	coffee	11/19/08	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
202410	ODR	green coffee beans	12/07/08	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
205249	ODR	green coffee	08/11/09	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
206992	ODR	roasting coffee	06/03/10	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
207016	ODR	burnt toast	06/09/10	Barefoot Coffee Roasters, In	76 Sunol Street	San Jose	Unconfirmed
205677	ODR	fumes	09/30/09	NONE	843 Farm Dr	San Jose	Unconfirmed
198052	ODR	skunk	08/15/07	NONE	880 Freeway & Montague Ex	San Jose	Unconfirmed
204086	ODR	gas	03/14/09	Keith Roofing Co.	920 Lincoln Ave	San Jose	Unconfirmed
204417	ODR	sewage	04/15/09	Margarita Townshomes Port	928 Villa Ave	San Jose	Unconfirmed
199201	ODR	fossil fuel	01/03/08	Construction	930 Villa Ave	San Jose	Unconfirmed
207198	ODR	paint	07/07/10	Water Tanks	Ashmont Dr	San Jose	Unconfirmed
205476	ODR	chemical	09/12/09	NONE	Atlanta & Bird Ave	San Jose	Unconfirmed
206669	ODR	noxious	03/27/10	NONE	Berryessa Rd and Commerci	San Jose	Unconfirmed
205873	ODR	chemical	10/21/09	American Metal Co	Berryessa Rd/Commercial	San Jose	Unconfirmed
197938	ODR	foul garbage	08/02/07	Commercial Business	Capital Ave	San Jose	Unconfirmed
199939	ODR	paint fumes/solvent	04/02/08	NONE	Charter Park Dr	San Jose	Unconfirmed
202522	ODR	brng plastics	12/08/08	NONE	crnr of N 18th /Jackson	San Jose	Unconfirmed
200041	ODR	tar & smoke	04/15/08	Commercial Building Constr	De Anza Blvd & Bollinger Rd	San Jose	Confirmed
199268	ODR	horrible	01/14/08	NONE	Hwy 101 / Gudalupe Parkway	San Jose	Unconfirmed
205295	ODR	spoiled tomato soup	08/20/09	NONE	Kerley Dr & Archer	San Jose	Unconfirmed
204039	ODR	really bad	03/10/09	SFD	Kitchener	San Jose	Unconfirmed
206527	ODR	chemical	03/06/10	Palm Ct Apts	Lick / Humboldt	San Jose	Unconfirmed
200288	ODR	smokey meat	05/21/08	Chau's Restaurant	Meridian St	San Jose	Unconfirmed

206526	ODR	chemical / medical	03/05/10	NONE	Monterey Highway / Blossom	San Jose	Unconfirmed
199270	ODR	bad sewage	01/01/08	NONE	NONE	San Jose	Unconfirmed
206651	ODR	bad	03/01/08	NONE	NONE	San Jose	Unconfirmed
200087	ODR	awful	04/22/08	NONE	NONE	San Jose	Unconfirmed
200596	ODR	bad	06/29/08	NONE	NONE	San Jose	Unconfirmed
200837	ODR	acrid	07/31/08	NONE	NONE	San Jose	Unconfirmed
201110	ODR	like rotten eggs	08/29/08	NONE	NONE	San Jose	Unconfirmed
201737	ODR	bad	10/27/08	Recycling Plant	NONE	San Jose	Unconfirmed
201770	ODR	burnt almonds	10/28/08	NONE	NONE	San Jose	Unconfirmed
202063	ODR	strong	11/24/08	NONE	NONE	San Jose	Unconfirmed
202154	ODR	foul	11/24/08	NONE	NONE	San Jose	Unconfirmed
202893	ODR	sewer/human waste	12/30/08	NONE	NONE	San Jose	Unconfirmed
203167	ODR	gas	01/13/09	NONE	NONE	San Jose	Unconfirmed
203915	ODR	stink bomb	02/26/09	NONE	NONE	San Jose	Unconfirmed
203917	ODR	rotten eggs	02/26/09	NONE	NONE	San Jose	Unconfirmed
204426	ODR	petroleum	04/17/09	NONE	NONE	San Jose	Unconfirmed
204455	ODR	sewage	04/21/09	NONE	NONE	San Jose	Unconfirmed
204881	ODR	gas	06/24/09	NONE	NONE	San Jose	Unconfirmed
205082	ODR	burnt tar	07/21/09	NONE	NONE	San Jose	Unconfirmed
205119	ODR	strange	07/26/09	NONE	NONE	San Jose	Unconfirmed
205409	ODR	chemical	09/03/09	NONE	NONE	San Jose	Unconfirmed
205714	ODR	burning	09/27/09	NONE	NONE	San Jose	Unconfirmed
206741	ODR	toxic	02/01/10	NONE	NONE	San Jose	Unconfirmed
206638	ODR	garbage	03/23/10	California Waste Solutions	NONE	San Jose	Unconfirmed
206872	ODR	sweet/smokey acrid	04/06/10	NONE	NONE	San Jose	Unconfirmed
206883	ODR	natural gas	04/11/10	NONE	NONE	San Jose	Unconfirmed
206846	ODR	sweet smoke	05/03/10	NONE	NONE	San Jose	Unconfirmed
207007	ODR	fish	06/07/10	NONE	NONE	San Jose	Unconfirmed
207392	ODR	spoiled tomato soup	08/11/10	NONE	NONE	San Jose	Unconfirmed
199739	ODR	burning, nauseous	03/07/08	NONE	Notre Dame & St James	San Jose	Unconfirmed
206760	ODR	causing coughing	04/15/10	SFD	Rigoberto Dr	San Jose	Unconfirmed
202677	ODR	natural gas	12/10/08	De Anza Hotel	Santa Clara and N Almaden I	San Jose	Unconfirmed
200598	ODR	gas	06/30/08	NONE	Sprial Dr and McLaughlin	San Jose	Unconfirmed
200749	ODR	something burnt	07/21/08	Super Tacqueria	Story Rd & White Rd	San Jose	Unconfirmed
202902	ODR	caustic	12/31/08	NONE	Westberry Dr and Hostetter	San Jose	Unconfirmed
199385	ODR	paint	01/30/08	Body Shop	Willow and Leeland	San Jose	Unconfirmed
199879	ODR	sewer	03/21/08	Pipeline	Zanker Rd & Trimble	San Jose	Unconfirmed

Appendix D-3

Rancho del Pueblo and iStar Sites - Community Risk Impact Analysis

RANCHO DEL PUEBLO AND iSTAR GENERAL PLAN AMENDMENT SITES, SAN JOSE, CA: AIR QUALITY COMMUNITY RISK IMPACT ANALYSIS

March 22, 2011
Revised April 6, 2011

♦ ♦ ♦

Prepared for:

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Prepared by:

James Reyff

ILLINGWORTH & RODKIN, INC.
Acoustics · Air Quality
505 Petaluma Boulevard South
Petaluma, CA 94952

Job No.: 08-209

TABLE OF CONTENTS

This report presents the community risk analysis results for Rancho del Pueblo and iStar General Plan Amendment sites in San Jose, California. Due to the close proximity of these sites to sources of toxic air contaminants (TACs), modeling of the health risk impacts were conducted. This air quality evaluation is limited in scope to an evaluation of the impacts of nearby air pollution sources upon possible future sensitive receptor developments at these sites.

I. INTRODUCTION

The Rancho del Pueblo Golf Course is located near U.S. 101 (Highway 101), just over 1,000 feet north of the Interstate 280/680 interchange. The site is bounded by Highway 101 to the southwest and King Road to the northeast. The only documented sources of TACs within 1,000 feet of the project site are Highway 101 and King Road traffic.

The iStar project site is located adjacent to and just north of State Route 85 (Highway 85), west of Monterey Highway, in south San José. Traffic on Highway 85 and Monterey Highway are the only substantial source of vehicle traffic air pollutant emissions near the site. A Union Pacific Rail Road (UPRR) rail line is located about 100 feet from the project site; diesel locomotives use this rail line. Stationary sources of air pollutant emissions located within 1,000 feet of the site, as reported by the Bay Area Air Quality Management District (BAAQMD), include sources at the Stion Corporation at 6321 San Ignacio Avenue, Ahead TeK at 6410 Via del Oro, Orchard Supply Hardware at 6450 Via del Oro, and Equinix Operating Co at 11 Great Oaks Blvd.

The primary concern is emissions of diesel particulate matter (DPM), which is considered an air toxic contaminant (TAC). Based on its potential to cause cancer, organic TACs from all vehicles, as well as fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$), are regulated air pollutants. This assessment describes the potential impacts from these types of air pollutants emitted from traffic, locomotives using the UPRR rail line, and stationary sources identified by BAAQMD.

1. BAAQMD Significance Thresholds

The BAAQMD adopted "Thresholds of Significance" for local community risk and hazard impacts that apply to both the siting of a new source and to the siting of a new receptor. Local community risk and hazard impacts are associated with TACs and $PM_{2.5}$ since emissions of these pollutants may cause significant health impacts at the local level[1]. BAAQMD guidelines recommend

1.1. Project Level Impacts

The proposed project would result in a significant impact if emissions of TACs or $PM_{2.5}$ exceed any of the following Thresholds of Significance:

- Non-compliance with a qualified risk reduction plan;
- An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic

[1] Note that the thresholds of significance do not officially become effective until May, 2011.

or acute) hazard index greater than 1.0 would be a cumulatively considerable contribution; or

- An incremental increase greater than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$ would be a cumulatively considerable contribution.

1.2. Cumulative Level Impacts

According to BAAQMD, a project would have a cumulative considerable impact if the aggregate total of all past, present, and foreseeable-future sources within a 1,000-foot radius from the fence line of a source, or from the location of a receptor, plus the contribution from the project, exceeds the following:

- Non-compliance with a qualified risk reduction plan;
- An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0; or
- 0.8 µg/m3 annual average $PM_{2.5}$.

Due to the close proximity of these sites and all future construction projects on these sites to a freeway, as well as the City of San Jose not having a qualified risk reduction plan, an analysis of TAC and $PM_{2.5}$ impacts upon sensitive receptors is necessary.

2. Description of Potential Impacts

2.1. Rancho Del Pueblo Site

A review of current traffic information reported by Caltrans and the City of San Jose indicates the following two roadways within 1,000 feet of the project as having average daily traffic in excess of 10,000 average daily trips (ADT):

- Highway 101 - ADT of 188,000 vehicles (Caltrans 2009)
- King Road – ADT of 15,000 vehicles (City of San José, Paul Ma, Transportation Systems Planning Manager)

Stationary sources listed by BAAQMD were not identified within 1,000 feet of the project site.

2.2. iStar Site

A review of traffic information (reported by Caltrans and the City) indicates the two roadways within 1,000 feet of the project with average daily traffic in excess of 10,000 average daily trips (ADT) to be the following:

- Highway 85 - ADT of 81,000 vehicles
- Monterey Highway – ADT of 12,500 vehicles

The Union Pacific Railroad (UPRR) rail line is located about 100 feet from the project site. Diesel locomotives use this rail line. The BAAQMD does not provide specific guidance on what level of railroad activity is considered significant; therefore, diesel locomotive travel on this rail line was evaluated.

A review of BAAQMD records indicates four stationary sources of air pollutant emissions within 1,000 feet of the site. They are as follows:

- Stion Corporation at 6321 San Ignacio Ave (BAAQMD does not consider this a significant source)
- Ahead TeK at 6410 Via del Oro (Cancer Risk at 0 in one million/PM2.5 =0.002)
- Orchard Supply Hardware at 6450 Via del Oro (Cancer Risk at 0.3 in one million/PM2.5 =0)
- Equinix Operating Co – SV1 at 11 Great Oaks Blvd (Cancer Risk at 6.2 in one million/PM2.5 =0.01)

II. LOCAL COMMUNITY RISK AND HAZARDS ANALYSIS

1. Methodology

For the Rancho Del Pueblo Site, emissions and air dispersion modeling of the traffic along Highway 101 and King Road was conducted to predict annual concentrations of DPM, total organic compounds, and fine particulate matter ($PM_{2.5}$). For the iStar site, modeling was conducted for the traffic along Highway 85 and Monterey Highway, diesel locomotives on the UPRR rail line, and a standby diesel generator (Plant No. 19635, Orchard Supply Hardware). Annual concentrations of DPM and total organic compounds were used to predict cancer and non-cancer health risks, in accordance with BAAQMD procedures.

1.1. Emissions Modeling

This analysis involved the development of future DPM, organic TAC and $PM_{2.5}$ emissions for traffic on Highways 101 and 85 and the King Road and Monterey Highway using the latest version of the CARB EMFAC2007 emission factor model with the traffic mix developed from Caltrans and model defaults for Santa Clara County. EMFAC2007 is the most recent version of the CARB motor vehicle emission factor model. DPM emissions are predicted by the model to decrease in the future. However, the current version of EMFAC2007 does not incorporate the effects of the recent on-road diesel vehicle regulations, which will substantially reduce DPM emissions even further. The requirements for diesel trucks are phased in for future years and depend on the model year of the trucks. Since this analysis assesses the long-term risk of proposed sensitive uses to future exposures, the lower future emissions were taken into account. The diesel truck age distribution used in the EMFAC2007 model was adjusted to reflect the effects of the new regulations. These adjustments include recent action by CARB to delay some of the requirements of the regulation.

CARB's new regulations require on-road diesel trucks to be retrofitted with particulate matter controls or replaced to meet new 2010 engine standards that have much lower DPM and $PM_{2.5}$ emissions. This regulation will substantially reduce these emissions between 2013 and 2023, with the greatest reductions occurring in 2015 through 2020. While new trucks and buses will meet strict federal standards, this measure is intended to accelerate the rate at which the fleet either turns over so there are cleaner vehicles on the road, or retrofitted to meet similar standards.

With this regulation, older, more polluting trucks would be removed from the roads much quicker. CARB anticipates a 68 percent reduction in $PM_{2.5}$ (including DPM) emission from trucks in 2014 with this regulation.

The requirements for diesel trucks are phased in for future years and depend on the model year of the trucks. Since this analysis assesses the risk of proposed sensitive uses to future exposures, the lower future emissions were taken into account. The diesel truck age distribution used in the EMFAC2007 model for years 2015 and beyond were adjusted to reflect the effects of the new regulations. The EMFAC2007 results were then adjusted to the traffic volume and mix on Highways 101 and 85 reported by Caltrans[2]. Traffic volumes on the King Road and Monterey Highway were provided by the City of San Jose. Average daily traffic volumes were assumed to increase by 2 percent per year, per City of San Jose recommendations.

DPM emission factors were developed for the years 2015 and 2025 using the calculated mix of cars and trucks on freeways reported by Caltrans (Highways 101 and 85) for King Road and Monterey Highway. For emission year 2015, which applies to years 2015 – 2024, model years 2000 – 2024 were used to calculate emissions with EMFAC2007. For emission year 2025, which applies to years 2025 onward, model years 2010 – 2025 were used to calculate emissions with EMFAC2007. The DPM emission calculations and emission factors are shown in Attachment 1 for the Rancho Pueblo Site and Attachment 2 for the iStar Site.

Emissions of total organic gases (TOG) were also calculated for 2015 and 2025 using the EMFAC2007 model. These TOG emissions were then used in the modeling the organic TACs. TOG emissions from both exhaust and from running evaporative losses from all vehicle types were calculated using EMFAC2007 default model values for Santa Clara County along with the traffic volumes and vehicle mixes for freeways and local roadways. The model year adjustments for diesel vehicles, discussed above, were not used when calculating TOG emissions. The TOG emission calculations and emission factors are also shown in Attachments 1 and 2. These tables also include the $PM_{2.5}$ emissions from all vehicles.

The EMFAC2007 model was also used to develop average hourly traffic distributions for Santa Clara County roadways, which were then applied to the average daily traffic volumes for freeways and local roadways to obtain hourly traffic volumes. The hourly traffic distributions used in the DPM analysis are shown in Attachment 3 for Rancho Pueblo Site and Attachment 4 for the iStar Site. The Attachments also show the hourly traffic distributions used for evaluating $PM_{2.5}$ and TOG. Average freeway travel speeds of 55 mph for Highway 101 and 65 mph for Highway 85 were used. An average speed of 45 mph was used for traffic on Monterey Highway and 30 mph for King Road.

<u>1.2. Roadway Dispersion Modeling</u>

Dispersion modeling of DPM and organic TAC emissions from traffic was conducted using the CAL3QHCR model, which is recommended by the BAAQMD for this type of analysis. Inputs to the model included road geometry, hourly traffic volumes, and the DPM and $PM_{2.5}$ emission factors. The aerial view of the Rancho Del Pueblo Site with modeling links and receptors is shown in Figure 1. The aerial view showing the iStar site in relation to the UPRR rail line,

[2] Caltrans, Based on 2009 Average Annual Daily Truck Traffic on the California State Highway System - http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/

Highway 85, and the Monterey Highway is shown in Figure 2. Modeling receptors were placed throughout the project site area to represent potential locations of dwelling units. These are shown in Appendix 5 for both sites. Hourly meteorological data were used in the modeling, along with hourly traffic volumes and emission rates. A set (1992 – 1997, excluding 1996) of five-year hourly meteorological data was obtained from the BAAQMD for the San Jose Airport, which is located about 11 miles northwest of the site, and was also used in the modeling (Figure 3).

Roadway links were extended at least 1,000 feet beyond the closest portion of the project site. The entire sites were assumed to be flat (i.e., flat terrain). Receptors were spaced in a grid with 130 feet separation (40 meters). Receptor heights were five feet above ground.

1.3. Caltrain & Union Pacific Railroad Emissions Modeling

The Union Pacific Rail Road (UPRR) line runs parallel to the Monterey Highway and is adjacent to the northeastern property boundary of the project site. This rail line is used by trains for passenger and freight service. Along this portion of the UPRR line, Caltrain operates 3 trains per weekday between Gilroy and San Jose; Amtrack has one passenger train daily; and UPRR operates freight trains. For this analysis it was assumed that up to 30 diesel trains would pass by the project site daily.

DPM and $PM_{2.5}$ emissions from trains passing by the project were calculated using EPA emission factors for locomotives[3] and information from Caltrain[4]. Caltrain's diesel locomotive engines range from 3,200 to 3,600 horsepower[5] and are currently using Tier 0+ or Tier 1 engines. Caltrain stated that the locomotive engines will go through mid-level overhaul around the year 2017, and at that time the best engine tier level will be used. These would be Tier 2+ or Tier 3 engines. The trains passing the project site were assumed to be traveling at about 60 mph with the engines operating at about 65% load. The Caltrain trains and operational characteristics at the project location were assumed to be representative of the other trains passing the site. Emissions were calculated for years 2015 and 2025. Table 7 shows the estimated DPM and $PM_{2.5}$ emissions along the rail line near the project site.

1.4. Rail Line Dispersion Modeling

Modeling of locomotive emissions was conducted using the EPA's ISCST3 dispersion model and same meteorological data from the Mineta San Jose airport that was used for the roadway modeling. Locomotive emissions were modeled as a line source (series of volume sources) along the rail line in the vicinity of project. Attachment 6 includes details on the assumptions used with the modeling and the DPM and $PM_{2.5}$ locomotive emission rates used.

1.5. Community Risk Assessment – Cancer Risk from Roadways & Rail Line

Using the modeled long-term average DPM and organic gas concentrations, the individual cancer risks were computed using methods recommended by BAAQMD[6] and the California Office of Environmental Health Hazard Assessment (OEHHA).[7]

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[3] *Emission Factors for Locomotives*, USEPA 2009 (EPA-420-F-09-025)

[4] Personal communication with Mr. Stephen Coleman, Manager, Rail Equipment, Caltrain. March 9, 2011.

[5] http://www.caltrain.com/about/statsandreports/commutefleets.html

[6] BAAQMD, *Air Toxics NSR Program Health Risk Screening Analysis (HSRA) Guidelines*, January 2010.

[7] OEHHA 2003. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance*

The factors used to compute cancer risk are highly dependent on modeled concentrations, exposure period or duration, and the type of receptor. The exposure level is determined by the modeled concentration; however, it has to be averaged over a representative exposure period. The averaging period is dependent on many factors, but mostly the type of sensitive receptor that would reside at a site. This assessment conservatively assumed long-term residential exposures. OEHHA has developed exposure assumptions for typical types of sensitive receptors. These include nearly continuous exposures of 70 years for residences. It should be noted that the cancer risk calculations for 70-year residential exposures reflect use of BAAQMD's most recent cancer risk calculation method, adopted in January 2010. This method applies a Cancer Risk Adjustment Factor of 1.7 to the cancer risks for residential exposures, accounting for age sensitivity to toxic air contaminants. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs.

1.6. Community Risk Assessment – Hazard Impacts

Potential non-cancer health effects due to chronic exposure to DPM were not estimated since the concentration threshold for non-cancer effects is considerably higher than concentrations that would result in significant cancer risks that were described above. The chronic inhalation reference exposure level (REL) for DPM is 5 $\mu g/m^3$. The DPM air quality assessment predicted a maximum annual exposure much lower than the REL. Thus, the Hazard Index (HI), which is the ratio of the annual DPM concentration to the REL, would be much lower than significance criterion of a HI greater than 1.0. Similarly to DPM, the concentrations of organic TACs would be much lower than the toxicity-weighted, chronic non-cancer RELs for the mix of organic TACs in the TOG from tailpipe exhaust emissions and from evaporative losses[8]. This is consistent with the BAAQMD Screening Tables published for Santa Clara County roadways.

2. Predicted Cancer Risk

This analysis presents the cancer risk for residential types of uses where exposures are assumed to be nearly continuous for 70 years. Since risk of cancer is computed over a lifetime, the predicted change in exposure was accounted for where traffic and emission rates would change. Cancer risk was predicted for the year 2015 and 2025. A weighted exposure was computed based on these exposures (for a 70-year period, beginning in 2015). Under the BAAQMD CEQA Air Quality Guidelines, an incremental risk of greater than 10 cases per million from a single source at the Maximally Exposed Individual (MEI) would result in a significant impact.

2.1 Rancho Del Pueblo Cancer Risk

Table 1 shows the range of predicted cancer risks and annual $PM_{2.5}$ concentrations at this site. The site ranges from about 100 feet to beyond 1,000 feet from the nearest through lane of Highway 101. Receptors were placed about 100 feet from the nearest through lanes of Highway 101 and about 70 feet from the nearest through lanes of King Road. Based on interpolation of the predicted risks at the modeling receptors, significant cancer risks posed by Highway 101 traffic

Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August 2003.

[8] BAAQMD, *Recommended Methods for Screening and Modeling Local Risks and Hazards*, May 2010.

extend about 980 feet from the edge of the roadway. Significant cancer risks from King Road extend about 50 feet from the edge of that roadway.

Figure 1 – Rancho Del Pueblo Project Area and Modeling Roadway Links

Figure 2 – iStar Project Area and Modeling Roadway Links

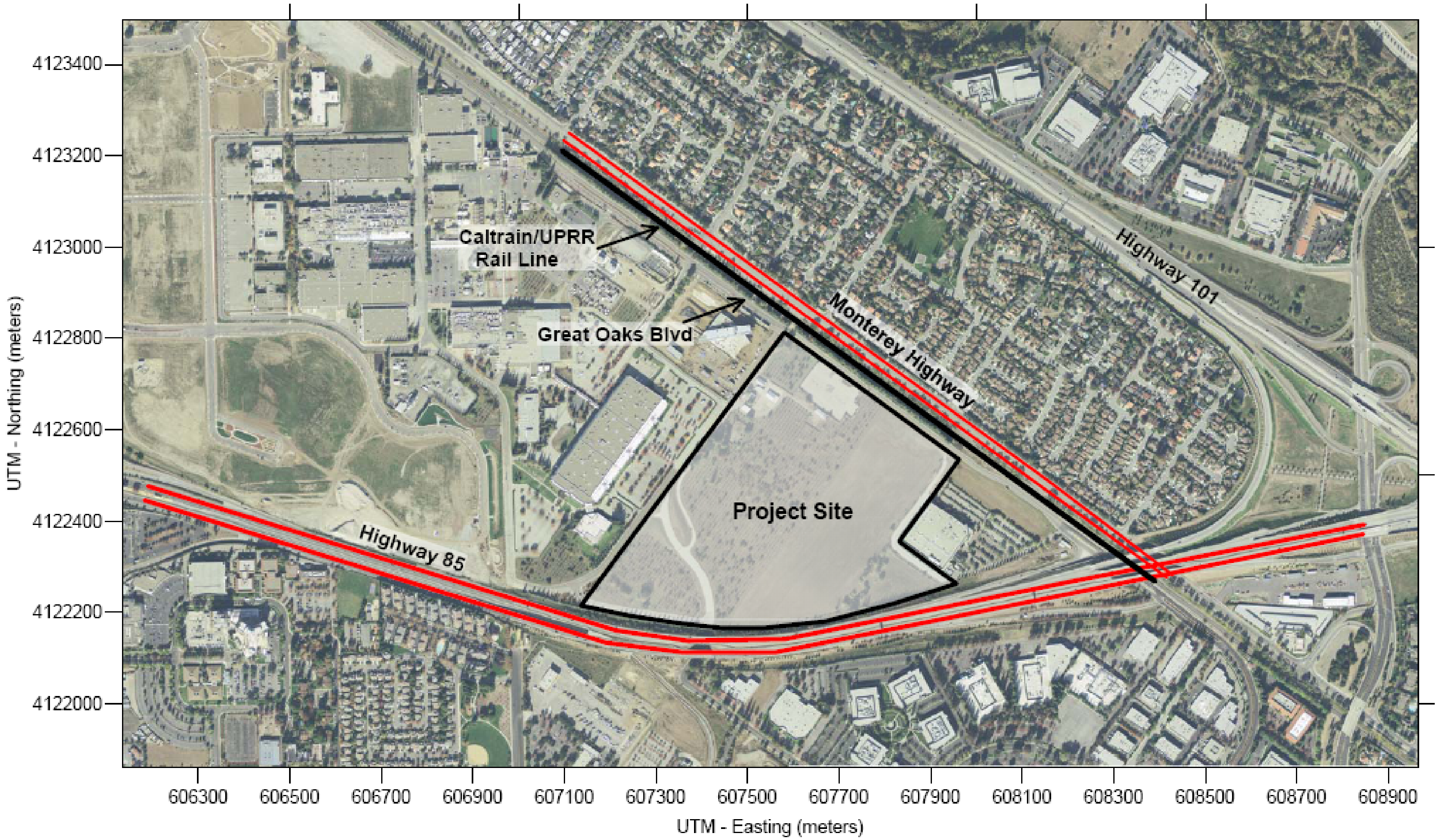
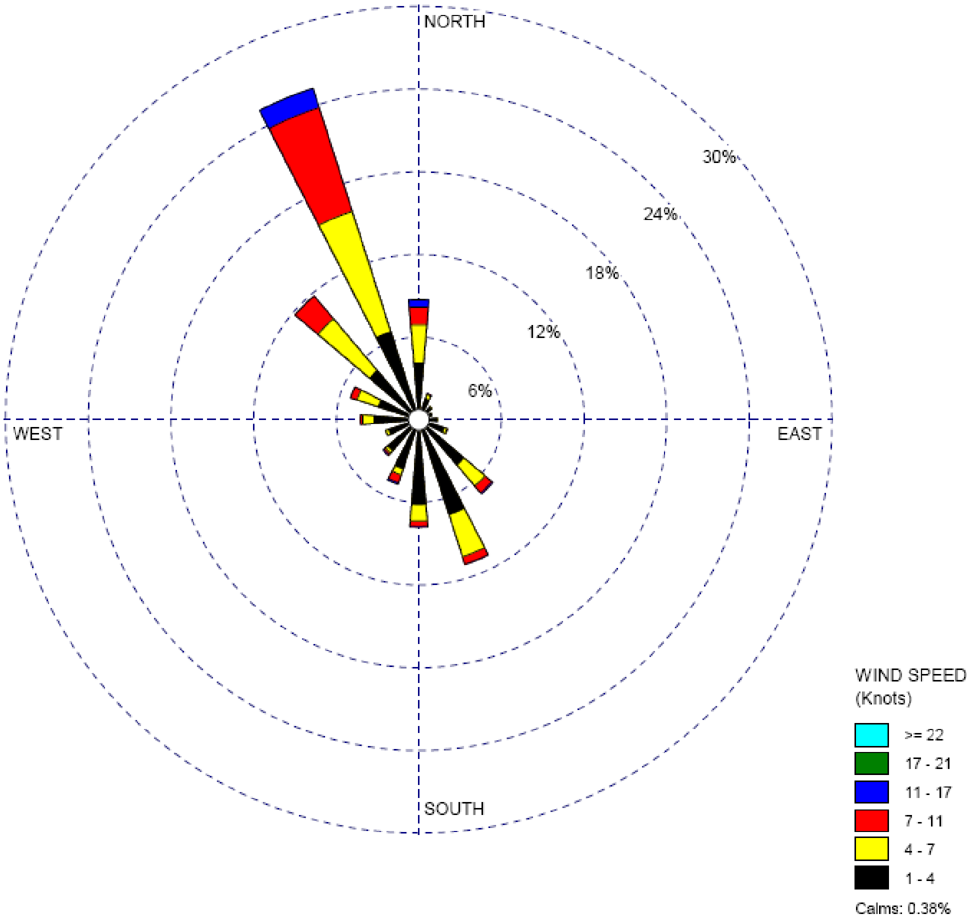


Figure 3 – Wind Rose for San Jose Airport

WIND ROSE PLOT:
San Jose Airport - 1992-1995, 1997

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: **1992 1993 1994 1995 1997** **Jan 1 - Dec 31** **00:00 - 23:00**		
	CALM WINDS: **0.38%**	TOTAL COUNT: **43824 hrs.**	
	AVG. WIND SPEED: **4.44 Knots**	DATE: **3/27/2009**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Table 1 – Increased Cancer Risk and Non-Cancer ($PM_{2.5}$) Risk for Rancho Del Pueblo

Emission Source	Receptor Location*	Cancer Risk (per million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Highway 101	Rec No. 1 - southwestern part of property closest to the highway	49.6	0.42
Highway 101	Rec No. 35 – 1,040 feet from Highway 101	9.2	0.07
King Road	Rec No. 75 – northern part of property	6.5	0.07
BAAQMD Threshold		10.0	0.3

* Refer to Attachment 5 - Figure A5-1 for receptor locations

2.2 iStar Cancer Risk

Computed cancer risks and $PM_{2.5}$ concentrations are shown in Table 2 for the iStar site. These include emissions from Highway 85, Monterey Highway and the UPRR rail line. The closest receptors for this site were located at 140 feet from the nearest through lane of Highway 85 and 230 feet from Monterey Highway (separated by the UPRR line). The UPRR line was about 170 feet from the closest modeled receptor. Note that cancer risks from Highway 85 reflect the relatively low volume of trucks on this freeway due to restrictions.

Table 2 –Maximum Increased Cancer Risk and Non-Cancer ($PM_{2.5}$) Risk for iStar Site

Emission Source	Receptor Location*	Cancer Risk (per million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Highway 85 & Monterey Highway	Rec No. 5 - southern part of property, 140 feet from Highway 85	1.8	0.14
UPRR Locomotives	Rec No. 135 – northern part of property, 170 feet from the UPRR line	5.9	0.02
BAAQMD Threshold		10.0	0.3

* Refer to Attachment 5 - Figure A5-2 for receptor locations

Details of the cancer risk calculations are shown in Attachment 7 for the Rancho Del Pueblo site and Attachment 8 for the iStar site.

2.3. Community Risk Assessment – PM2.5 Impacts

In addition to evaluating the health risks from TACs, potential impacts from $PM_{2.5}$ emissions from traffic and locomotives on the UPRR rail line were evaluated. $PM_{2.5}$ concentrations were modeled to evaluate the potential impact of exposure to exhaust produced from traffic and locomotives near the sites. To evaluate potential non-cancer health effects due to $PM_{2.5}$, the BAAQMD had adopted a significance threshold of an annual average $PM_{2.5}$ concentration greater than 0.3 $\mu g/m^3$.

The same basic modeling approach that was used for assessing TAC impacts was used in the modeling of $PM_{2.5}$ concentrations from traffic. $PM_{2.5}$ emissions from all vehicles were used, rather than just the diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$.

The assessment involved, first, calculating $PM_{2.5}$ emission rates from traffic and locomotives traveling near the sites. Then, dispersion modeling using emission factors and traffic volumes was applied. The dispersion model provides estimated annual $PM_{2.5}$ concentrations at receptors representative of living areas (sensitive land uses). $PM_{2.5}$ emissions were calculated using the EMFAC2007 model for the mix of traffic on the highways and local roads for 2015 and 2025. Hourly traffic volumes were also calculated in the same manner as discussed earlier for the TAC modeling. The emission rate calculations are shown in Attachments 1 and 2 and hourly traffic volumes are shown in Attachments 3 and 4. The dispersion modeling of traffic using the CAL3QHCR model also used the five years of meteorological data from the San Jose Airport and the same receptor locations that were used with the TAC modeling.

Locomotive $PM_{2.5}$ emissions are shown in Attachment 6. The dispersion modeling of the rail line was conducted using the same procedures as the locomotive DPM modeling, previously discussed.

The maximum annual average $PM_{2.5}$ concentrations occurred at the same receptors that had the maximum cancer risks. Maximum annual average $PM_{2.5}$ concentrations were calculated for each of the five years of meteorological data used, as well as long term average $PM_{2.5}$ concentrations (5-year averages). Tables 1 and 2 (above) show the modeled annual average $PM_{2.5}$ concentrations. The concentrations reported are the maximum modeled for either 2015 or 2025.

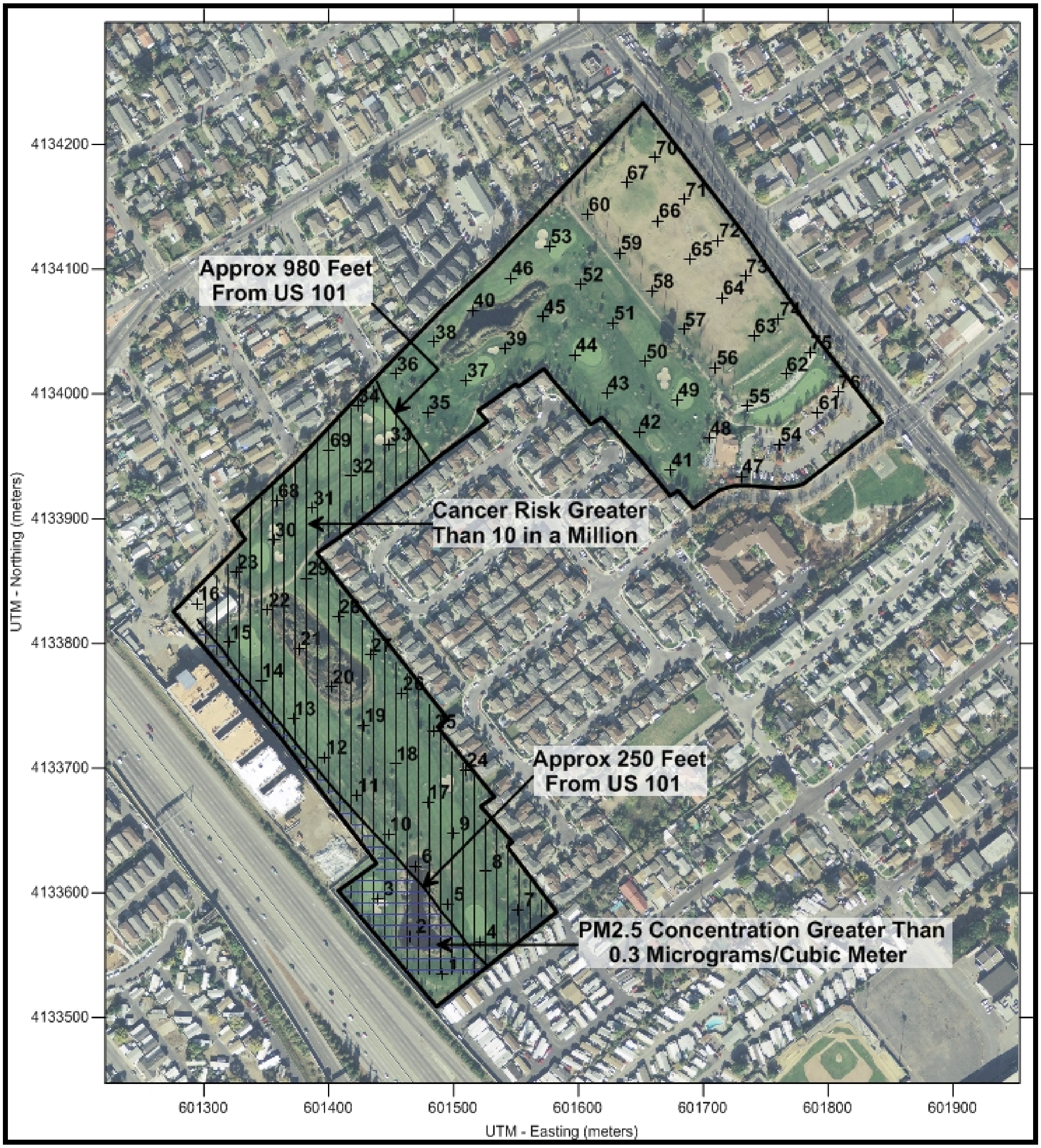
Based on interpolation of the predicted risks at the modeling receptors for the Rancho del Pueblo site, significant non-cancer $PM_{2.5}$ risks posed by Highway 101 traffic extend about 250 feet from the edge of the roadway. Figure 4 shows the extent of the cancer risk and significant $PM_{2.5}$ concentrations.

Average annual $PM_{2.5}$ concentrations on the iStar site are not projected to exceed the BAAQMD threshold of 0.3 $\mu g/m^3$.

3. Stationary Sources

As described earlier, any stationary sources of air pollution within 1,000 feet of the project sites were identified. Only the iStar site had stationary sources within 1,000 feet of the closest boundary. The BAAQMD screening risk, hazards and $PM_{2.5}$ concentrations were identified in consultation with BAAQMD. One source, Plant No. 19635 - Orchard Supply Hardware, has a standby diesel generator, but BAAAMD did not have cancer risk or $PM_{2.5}$ numbers for this source, only emission rates from the generator. Therefore, this source's impact upon the proposed project was evaluated using screening-level dispersion modeling.

Figure 4 – Extent of Significant Cancer Risk and $PM_{2.5}$ Concentrations at the Rancho Del Pueblo Site



The source associated with Plant No. 19635 is an emergency diesel generator. To obtain an estimate of potential cancer risks from this source the SCREEN3 dispersion model was used to estimate the maximum annual DPM concentration at the project site. The DPM emissions provided by BAAQMD were 0.0239 pounds per day. It was assumed that this generator would be operated for 50 hours per year. BAAQMD stack parameters for generators (6 feet high stack, 3 inch diameter, 50 meter/sec exit velocity, and exit temperature of 656 degrees F), and dimensions of the adjacent store building were used in the modeling. The SCREEN3 model maximum 1-hour DPM concentration was 0.0057 $\mu g/m^3$. Using a one hour to annual conversion factor of 0.1, the annual DPM concentration is 0.00057 $\mu g/m^3$. Based on this annual concentration and a unit risk factor of 541.5 cancer risk per million per $\mu g/m^3$ of DPM for a 70-year residential exposure the estimated cancer risk is 0.3 per million.

In addition to the above stationary source, the Equinix SV1 facility exists immediately adjacent to the south and southeastern portions of the site. This facility currently has three 750-kilowatt generators and four 2-megawatt generators that all operate off diesel fuel. These generators are tested about once per month.

Dispersion modeling of generator-testing was conducted to identify the incremental health risk at the iStar residential site. The Equinix SV1 generator modeling was based on available information provided by Equinix and BAAQMD through a public records request[9]. Routine testing of the existing generators were modeled using the ISCST3 dispersion model and meteorological data measured at San Jose International Airport. The maximum predicted annual concentration of DPM at the Great Oaks site is 0.0114 $\mu g/m^3$. This would equate to a 70-year lifetime cancer risk of 6.2 excess cancer cases per million people living near the source.

Equinix is also planning an expansion in operations and a new building (SV5) housing seven additional standby diesel generators. These generators would be subject to more stringent emissions standards established by CARB and adopted by BAAQMD. The emission sources would be elevated, above the building. Modeled DPM concentrations from these generators would be less, than the existing generators. The maximum predicted annual concentration of DPM from SV5 would be 0.00024 $\mu g/m^3$. This equates to an excess lifetime cancer risk of 0.1 in one million.

4. Cumulative Air Contaminant Exposure

Only two sources affect the Rancho Del Pueblo site: Highway 101 and King Road. Because of the relatively large distances between these sources, they have relatively low cumulative impacts. While the single source cancer risk thresholds are exceeded along Highway 101, the cumulative levels are well below the thresholds. King Road contributes little to the cancer risk and $PM_{2.5}$ concentrations along Highway 101 where significant cancer risk and $PM_{2.5}$ concentrations would be significant.

The iStar site is affected by several sources of TACs. Table 3 shows the cancer risk,

[9] BAAQMD Engineering Evaluation Report, Equinix Operating Company Plant #14676, Application 5816.

hazard index, and $PM_{2.5}$ concentrations associated with each source affecting the project site. The sum of impacts from cumulative sources (i.e., sources within 1,000 feet of the project) would be below the thresholds used by BAAQMD.

Table 3 – Impacts from Cumulative Sources

Source	**Maximum Cancer Risk (per million)**	**Maximum Hazard Index**	**Maximum Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)**
Highway 85 and Monterey Highway Traffic	1.8	4E-4	0.16
Caltrain and Union Pacific Railroad	5.9	0.005	0.02
Plant No. 12845 - Ahead TeK	0.0	0.0	0.02
Plant No. 19733 – Stion Corporation	0.0	0.0	0.0
Plant No. 19635 - Orchard Supply Hardware	0.3	0.004	0.00
Equinix Corporation – SV1	6.2	0.002	0.01
Equinix Corporation – SV5 (future)	3.2	0.001	0.01
Maximum Single Source	6.2	0.005	0.16
BAAQMD Threshold - Single Source	***10***	***1.0***	***0.3***
Cumulative Sources	17.4	0.01	0.22
BAAQMD Threshold – Cumulative Sources	***100***	***10.0***	***0.8***

Attachment 1: Vehicle Emission Rates – Highway 101 and King Road

Table A1-1 – Highway 101 Traffic Data and Diesel PM Emission Factors

Analysis Year = *2015*

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	2015 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	114,838	128,618	0.00%	0	0.02000	55	0.00
LDT	61,882	69,308	0.33%	227	0.0200	55	4.54
MDT	5,621	6,296	5.88%	370	0.0166	55	6.15
HDT	5,659	6,338	93.55%	5929	0.1714	55	1016.34
Total	188,000	210,560	-	6,527	-	-	1,027
Diesel Vech Avg DPM EF					**0.15736**		
Mix Avg DPM EF					0.00488		
Increase From 2009		1.12					
Vehicles/Direction		105,280		3263			
Vehicles/Hour/Direction		4,387		**136.0**			

Analysis Year = *2020*

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2020 Number Vehicles (vech/day)	2020 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	116,136	141,686	0.00%	0	0.00000	55	0.00
LDT	60,584	73,912	0.00%	0	0.0000	55	0.00
MDT	5,621	6,858	6.49%	445	0.0116	55	5.17
HDT	5,659	6,904	90.91%	6276	0.1052	55	660.27
Total	188,000	229,360	-	6,722	-	-	665
Diesel Vech Avg DPM EF					**0.09900**		
Mix Avg DPM EF					0.00290		
Increase From 2009		1.22					
Vehicles/Direction		114,680		3361			
Vehicles/Hour/Direction		4,778		**140.0**			

Analysis Year = *2025*

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	2025 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	115,409	152,340	0.00%	0	0.00000	55	0.00
LDT	61,311	80,931	0.00%	0	0.0000	55	0.00
MDT	5,621	7,420	5.33%	396	0.0083	55	3.26
HDT	5,659	7,470	93.55%	6988	0.0823	55	574.94
Total	188,000	248,160	-	7,384	-	-	578.20
Diesel Vech Avg DPM EF					**0.07831**		
Mix Avg DPM EF					0.00233		
Increase From 2009		1.32					
Vehicles/Direction		124,080		3692			
Vehicles/Hour/Direction		5,170		**153.8**			

Traffic Data Year = *2009*

CalTrans 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
Hwy 101 A Jct Rte 280 & Rte 680	188,000	11,280	5,621	1,516	306	3,837

Traffic Increase per Year (%) = *2.0%*

Table A1-2 – South King Road Traffic Data and Diesel PM Emission Factors

Analysis Year = ***2015***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	2015 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	8,604	9,636	0.00%	0	0.03200	30	0.00
LDT	4,636	5,193	0.33%	17	0.0320	30	0.54
MDT	1,227	1,375	5.88%	81	0.0260	30	2.10
HDT	532	596	93.55%	558	0.1453	30	81.06
Total	15,000	16,800	-	656	-	-	83.70
Diesel Vech Avg DPM EF					**0.12765**		
Mix Avg DPM EF					0.00498		
Increase From 2009		1.12					
Vehicles/Direction		8,400		328			
Vehicles/Hour/Direction		350		**13.7**			

Traffic Data Year = ***2009***

City of San Jose 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
South King Road	15,000	1,760	1,227	177	177	177
County-wide average			8.18%	1.18%	1.18%	1.18%

Analysis Year = ***2020***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2020 Number Vehicles (vech/day)	2020 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	8,714	10,631	0.00%	0	0.00000	30	0.00
LDT	4,546	5,546	0.00%	0	0.0000	30	0.00
MDT	1,215	1,482	6.49%	96	0.0178	30	1.71
HDT	525	641	90.91%	582	0.0878	30	51.12
Total	15,000	18,300	-	679	-	-	52.84
Diesel Vech Avg DPM EF					**0.07787**		
Mix Avg DPM EF					0.00289		
Increase From 2009		1.22					
Vehicles/Direction		9,150		339			
Vehicles/Hour/Direction		381		**14.1**			

Traffic Data Year = ***2009***

City of San Jose 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
South King Road	15,000	1,740	1,215	175	175	175
County-wide average			8.10%	1.17%	1.17%	1.17%

Analysis Year = ***2025***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	2025 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	8,670	11,445	0.00%	0	0.00000	30	0.00
LDT	4,606	6,080	0.00%	0	0.0000	30	0.00
MDT	1,218	1,608	5.33%	86	0.0130	30	1.11
HDT	506	667	93.55%	624	0.0721	30	44.99
Total	15,000	19,800	-	710	-	-	46.10
Diesel Vech Avg DPM EF					**0.06493**		
Mix Avg DPM EF					0.00233		
Increase From 2009		1.32					
Vehicles/Direction		9,900		355			
Vehicles/Hour/Direction		413		**14.8**			

Traffic Data Year = ***2009***

City of San Jose 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
South King Road	15,000	1,724	1,218	169	169	169
County-wide average			8.12%	1.12%	1.12%	1.12%

Traffic Increase per Year (%) = ***2.0%***

Table A1-3 – Highway 101 Traffic Data & PM2.5 and TOG Emission Factors

Analysis Year = ***2015***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	Emission Factors: Exhaust PM2.5 (g/VMT)	Emission Factors: Exhaust TOG (g/VMT)	Emission Factors: Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions: Exhaust PM2.5 (g/mi)	Total Vehicle Emissions: Exhaust TOG (g/mi)	Total Vehicle Emissions: Running* TOG (g/mi)
LDA	111,560	124,947	0.0070	0.0380	0.034	55	875	4748	4225
LDT	65,160	72,980	0.0141	0.0704	0.064	55	1029	5138	4702
MDT	5,621	6,296	0.0165	0.0689	0.045	55	104	434	281
HDT	5,659	6,338	0.1965	0.3328	0.006	55	1245	2109	40.8
Total	188,000	210,560	-	-	-	55	3,253	12,429	9,249
Mix Avg Emission Factor			**0.01545**	**0.05903**	**0.04393**				
2009		1.12							
Vehicles/Direction		105,280							
Vehicles/Hour/Direction		**4,387**							

Analysis Year = ***2020***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2020 Number Vehicles (vech/day)	Emission Factors: Exhaust PM2.5 (g/VMT)	Emission Factors: Exhaust TOG (g/VMT)	Emission Factors: Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions: Exhaust PM2.5 (g/mi)	Total Vehicle Emissions: Exhaust TOG (g/mi)	Total Vehicle Emissions: Running* TOG (g/mi)
LDA	111,231	135,702	0.0070	0.0210	0.026	55	950	2850	3553
LDT	65,489	79,897	0.0140	0.0386	0.052	55	1122	3083	4166
MDT	5,621	6,858	0.0171	0.0476	0.041	55	117	326	284
HDT	5,659	6,904	0.1311	0.2136	0.005	55	905	1475	34.5
Total	188,000	229,360	-	-	-	55	3,094	7,733	8,038
Mix Avg Emission Factor			**0.01349**	**0.03372**	**0.03505**				
Increase From 2009		1.22							
Vehicles/Direction		114,680							
Vehicles/Hour/Direction		**4,778**							

Analysis Year = ***2025***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	Emission Factors: Exhaust PM2.5 (g/VMT)	Emission Factors: Exhaust TOG (g/VMT)	Emission Factors: Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions: Exhaust PM2.5 (g/mi)	Total Vehicle Emissions: Exhaust TOG (g/mi)	Total Vehicle Emissions: Running* TOG (g/mi)
LDA	110,903	146,392	0.0070	0.0140	0.021	55	1025	2049	3034
LDT	65,817	86,879	0.0143	0.0266	0.043	55	1242	2314	3742
MDT	5,621	7,420	0.0168	0.0339	0.037	55	124	252	278
HDT	5,659	7,470	0.0993	0.1564	0.004	55	742	1169	30.8
Total	188,000	248,160	-	-	-	55	3,133	5,783	7,085
Mix Avg Emission Factor			**0.01263**	**0.02330**	**0.02855**				
Increase From 2009		1.32							
Vehicles/Direction		124,080							
Vehicles/Hour/Direction		**5,170**							

Traffic Data Year = ***2009***

CalTrans 2009 AADT Data	Total	Total Truck	Truck by Axle: 2	3	4	5
Hwy 101 A Jct Rte 280 & Rte 680	188,000	11,280	5,621	1,516	306	3,837

Traffic Increase per Year (%) = ***2.0%***

*** Based on engine run time (min) =** ***30***

Table A1-4 – South King Road Traffic Data & PM2.5 and TOG Emission Factors

Analysis Year = ***2015***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	Emission Factors Exhaust PM2.5 (g/VMT)	Emission Factors Exhaust TOG (g/VMT)	Emission Factors Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions Exhaust PM2.5 (g/mi)	Total Vehicle Emissions Exhaust TOG (g/mi)	Total Vehicle Emissions Running* TOG (g/mi)
LDA	8,358	9,361	0.0090	0.0510	0.062	30	84	477	580
LDT	4,882	5,468	0.0194	0.0927	0.118	30	106	507	646
MDT	1,227	1,375	0.0226	0.0989	0.082	30	31	136	113
HDT	532	596	0.1914	0.5096	0.012	30	114	304	7.0
Total	15,000	16,800	-	-	-	30	335	1,424	1,346
Mix Avg Emission Factor			**0.01996**	**0.08475**	**0.08010**				
2009		1.12							
Vehicles/Direction		8,400							
Vehicles/Hour/Direction		**350**							

Analysis Year = ***2020***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2020 Number Vehicles (vech/day)	Emission Factors Exhaust PM2.5 (g/VMT)	Emission Factors Exhaust TOG (g/VMT)	Emission Factors Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions Exhaust PM2.5 (g/mi)	Total Vehicle Emissions Exhaust TOG (g/mi)	Total Vehicle Emissions Running* TOG (g/mi)
LDA	8,338	10,172	0.0090	0.0290	0.048	30	92	295	488
LDT	4,909	5,989	0.0196	0.0533	0.096	30	117	319	573
MDT	1,227	1,498	0.0230	0.0679	0.076	30	34	102	114
HDT	525	641	0.1218	0.3451	0.009	30	78	221	5.9
Total	15,000	18,300	-	-	-	30	321	937	1,181
Mix Avg Emission Factor			**0.01756**	**0.05121**	**0.06451**				
Increase From 2009		1.22							
Vehicles/Direction		9,150							
Vehicles/Hour/Direction		**381**							

Analysis Year = ***2025***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	Emission Factors Exhaust PM2.5 (g/VMT)	Emission Factors Exhaust TOG (g/VMT)	Emission Factors Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions Exhaust PM2.5 (g/mi)	Total Vehicle Emissions Exhaust TOG (g/mi)	Total Vehicle Emissions Running* TOG (g/mi)
LDA	8,332	10,998	0.0090	0.0200	0.038	30	99	220	418
LDT	4,945	6,527	0.0192	0.0373	0.079	30	125	243	515
MDT	1,218	1,608	0.0234	0.0478	0.069	30	38	77	110
HDT	506	668	0.0918	0.2616	0.008	30	61	175	5.1
Total	15,000	19,800	-	-	-	30	323	715	1,049
Mix Avg Emission Factor			**0.01632**	**0.03609**	**0.05297**				
Increase From 2009		1.32							
Vehicles/Direction		9,900							
Vehicles/Hour/Direction		**413**							

Traffic Data Year = ***2009***

City of San Jose 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
South King Road	15,000	1,724	1,218	169	169	169
County-wide average			8.12%	1.12%	1.12%	1.12%

Traffic Increase per Year (%) = ***2.0%***

*** Based on engine run time (min) =** ***30***

Attachment 2: Vehicle Emission Rates – Highway 85 and Monterey Highway

Table A2-1 – Highway 85 Traffic Data and Diesel PM Emission Factors

Analysis Year = ***2015***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	2015 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	52,599	58,910	0.00%	0	0.02000	65	0.00
LDT	28,344	31,745	0.33%	104	0.0200	65	2.08
MDT	1,011	1,132	5.88%	67	0.0162	65	1.08
HDT	47	52	93.55%	49	0.2228	65	10.94
Total	82,000	91,840	-	220	-	-	14.10
				9.15702			
Diesel Vech Avg DPM EF					**0.06415**		
Mix Avg DPM EF					0.00015		
Increase From 2009		1.12					
Vehicles/Direction		45,920		110			
Vehicles/Hour/Direction		1,913		**4.6**			

Analysis Year = ***2025***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	2025 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	52,860	69,776	0.00%	0	0.00000	65	0.00
LDT	28,082	37,068	0.00%	0	0.0000	65	0.00
MDT	1,011	1,334	5.33%	71	0.0080	65	0.57
HDT	47	62	93.55%	58	0.1002	65	5.80
Total	82,000	108,240	-	129	-	-	6.37
				5.37582			
Diesel Vech Avg DPM EF					**0.04935**		
Mix Avg DPM EF					0.00006		
Increase From 2009		1.32					
Vehicles/Direction		54,120		65			
Vehicles/Hour/Direction		2,255		**2.7**			

Traffic Data Year = ***2009***

CalTrans 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
Great Oaks Blvd Connection	82,000	1,058	1,011	15	27	5
Truck AADT - Jct. Rte 85 & Hwy 101		1.29%	1.23%	0.02%	0.03%	0.01%

Traffic Increase per Year (%) = ***2.0%***

Table A2-2 – Monterey Highway Traffic Data and Diesel PM Emission Factors

Analysis Year = ***2015***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	2015 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	8,018	8,980	0.00%	0	0.02300	45	0.00
LDT	4,321	4,839	0.33%	16	0.0230	45	0.36
MDT	154	173	5.88%	10	0.0186	45	0.19
HDT	7	8	93.55%	7	0.1423	45	1.07
Total	12,500	14,000	-	34	-	-	1.62
Diesel Vech Avg DPM EF					**0.04832**		
Mix Avg DPM EF					0.00012		
Increase From 2009		1.12					
Vehicles/Direction		7,000		17			
Vehicles/Hour/Direction		292		**0.7**			

Analysis Year = ***2025***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	2025 Percent Diesel	Number Diesel	Avg. DPM EF (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions (g/mi)
LDA	8,058	10,637	0.00%	0	0.00000	45	0.00
LDT	4,281	5,651	0.00%	0	0.0000	45	0.00
MDT	154	203	5.33%	11	0.0093	45	0.10
HDT	7	9	93.55%	9	0.0713	45	0.63
Total	12,500	16,500	-	20	-	-	0.73
Diesel Vech Avg DPM EF					**0.03707**		
Mix Avg DPM EF					0.00004		
Increase From 2009		1.32					
Vehicles/Direction		8,250		10			
Vehicles/Hour/Direction		344		**0.4**			

Traffic Data Year = ***2009***

City of San Jose 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
Monterey Highway	12,500	161	154	2	4	1
Truck AADT - Jct. Rte 85 & Hwy 101		1.29%	1.23%	0.02%	0.03%	0.01%

Traffic Increase per Year (%) = ***2.0%***

Table A2-3 – Highway 85 Traffic Data & $PM_{2.5}$ and TOG Emission Factors

Analysis Year = ***2015***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	Emission Factors Exhaust PM2.5 (g/VMT)	Emission Factors Exhaust TOG (g/VMT)	Emission Factors Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions Exhaust PM2.5 (g/mi)	Total Vehicle Emissions Exhaust TOG (g/mi)	Total Vehicle Emissions Running* TOG (g/mi)
LDA	51,097	57,229	0.0080	0.0480	0.029	65	458	2747	1638
LDT	29,845	33,427	0.0177	0.0873	0.055	65	593	2918	1822
MDT	1,011	1,132	0.0199	0.0830	0.038	65	22	94	43
HDT	47	52	0.2568	0.4084	0.005	65	13	21	0.3
Total	82,000	91,840	-	-	-	65	1,087	5,781	3,503
Mix Avg Emission Factor			**0.01183**	**0.06294**	**0.03814**				
2009		1.12							
Vehicles/Direction		45,920							
Vehicles/Hour/Direction		**1,913**							

Analysis Year = ***2025***

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	Emission Factors Exhaust PM2.5 (g/VMT)	Emission Factors Exhaust TOG (g/VMT)	Emission Factors Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions Exhaust PM2.5 (g/mi)	Total Vehicle Emissions Exhaust TOG (g/mi)	Total Vehicle Emissions Running* TOG (g/mi)
LDA	50,796	67,051	0.0090	0.0180	0.018	65	603	1207	1176
LDT	30,146	39,793	0.0182	0.0329	0.036	65	724	1309	1450
MDT	1,011	1,334	0.0208	0.0404	0.032	65	28	54	42
HDT	47	62	0.1229	0.1582	0.003	65	8	10	0.2
Total	82,000	108,240	-	-	-	65	1,363	2,579	2,669
Mix Avg Emission Factor			**0.01259**	**0.02383**	**0.02466**				
Increase From 2009		1.32							
Vehicles/Direction		54,120							
Vehicles/Hour/Direction		**2,255**							

Traffic Data Year = ***2009***

CalTrans 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
Great Oaks Blvd Connection	82,000	1,058	1,011	15	27	5
Truck AADT - Jct. Rte 85 & Hwy 101		1.29%	1.23%	0.02%	0.03%	0.01%

Traffic Increase per Year (%) = ***2.0%***

*** Based on engine run time (min) =** ***30***

Table A2-4 – Monterey Highway Traffic Data and $PM_{2.5}$ & TOG Emission Factors

Analysis Year = *2015*

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2015 Number Vehicles (vech/day)	Emission Factors Exhaust PM2.5 (g/VMT)	Emission Factors Exhaust TOG (g/VMT)	Emission Factors Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions Exhaust PM2.5 (g/mi)	Total Vehicle Emissions Exhaust TOG (g/mi)	Total Vehicle Emissions Running* TOG (g/mi)
LDA	7,789	8,724	0.0060	0.0370	0.041	45	52	323	361
LDT	4,550	5,096	0.0135	0.0680	0.079	45	69	347	401
MDT	154	173	0.0159	0.0699	0.055	45	3	12	9
HDT	7	8	0.1688	0.3379	0.008	45	1	3	0.1
Total	12,500	14,000	-	-	-	45	125	684	771
Mix Avg Emission Factor			**0.00893**	**0.04888**	**0.05509**				
2009		1.12							
Vehicles/Direction		7,000							
Vehicles/Hour/Direction		**292**							

Analysis Year = *2025*

Vehicle Type	2009 CalTrans Number Vehicles (vech/day)	2025 Number Vehicles (vech/day)	Emission Factors Exhaust PM2.5 (g/VMT)	Emission Factors Exhaust TOG (g/VMT)	Emission Factors Running TOG (g/VMT)	Vehicle Speed (mph)	Total Vehicle Emissions Exhaust PM2.5 (g/mi)	Total Vehicle Emissions Exhaust TOG (g/mi)	Total Vehicle Emissions Running* TOG (g/mi)
LDA	7,743	10,221	0.0060	0.0140	0.025	45	61	143	259
LDT	4,595	6,066	0.0137	0.0266	0.053	45	83	162	319
MDT	154	203	0.0161	0.0338	0.046	45	3	7	9
HDT	7	9	0.0869	0.1783	0.005	45	1	2	0.0
Total	12,500	16,500	-	-	-	45	148	313	588
Mix Avg Emission Factor			**0.00899**	**0.01898**	**0.03561**				
Increase From 2009		1.32							
Vehicles/Direction		8,250							
Vehicles/Hour/Direction		**344**							

Traffic Data Year = *2009*

City of San Jose 2009 AADT Data	Total	Total Truck	Truck by Axle 2	3	4	5
Monterey Highway	12,500	161	154	2	4	1
Truck AADT - Jct. Rte 85 & Hwy 101		1.29%	1.23%	0.02%	0.03%	0.01%

Traffic Increase per Year (%) = *2.0%*

*** Based on engine run time (min) = *30***

Attachment 3: Hourly Traffic Volumes for Highway 101 & South King Road

Table A3-1 – Hourly Traffic Volume and DPM Emission Rates: Highway 101 & South King Road

2015 - Hourly Traffic Volumes Per Direction and DPM Emission Rates- Hwy-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.74%	122	0.1558	9	6.48%	212	0.1567	17	5.73%	187	0.1591
2	1.99%	65	0.1345	10	7.31%	239	0.1617	18	3.02%	98	0.1353
3	2.11%	69	0.1230	11	6.36%	208	0.1594	19	2.19%	72	0.1379
4	3.64%	119	0.1680	12	6.92%	226	0.1596	20	0.98%	32	0.1313
5	2.10%	68	0.1578	13	6.29%	205	0.1610	21	3.02%	99	0.1552
6	3.66%	119	0.1699	14	6.21%	203	0.1596	22	4.19%	137	0.1627
7	6.63%	216	0.1690	15	5.31%	173	0.1589	23	2.26%	74	0.1521
8	5.03%	164	0.1587	16	3.95%	129	0.1535	24	0.88%	29	0.1450
								Total		3263.4	

2015 - Hourly Traffic Volumes Per Direction and DPM Emission rates- South King Road

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.92%	13	0.1218	9	6.48%	21	0.1272	17	5.58%	18	0.1317
2	2.45%	8	0.0951	10	7.21%	24	0.1322	18	3.29%	11	0.1047
3	2.79%	9	0.0840	11	6.31%	21	0.1299	19	2.34%	8	0.1083
4	3.50%	11	0.1394	12	6.83%	22	0.1306	20	0.98%	3	0.1091
5	2.19%	7	0.1234	13	6.11%	20	0.1334	21	3.07%	10	0.1245
6	3.42%	11	0.1444	14	6.10%	20	0.1311	22	4.07%	13	0.1347
7	6.19%	20	0.1438	15	5.15%	17	0.1319	23	2.36%	8	0.1196
8	4.82%	16	0.1332	16	3.92%	13	0.1259	24	0.90%	3	0.1159
								Total		327.9	

2020 - Hourly Traffic Volumes Per Direction and DPM Emission Rates- Hwy-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.88%	130	0.0956	9	6.42%	216	0.0990	17	5.60%	188	0.1021
2	2.19%	74	0.0804	10	7.42%	249	0.1002	18	2.78%	93	0.0898
3	2.28%	76	0.0726	11	6.45%	217	0.0994	19	2.11%	71	0.0917
4	3.70%	124	0.1029	12	7.03%	236	0.0999	20	0.80%	27	0.0945
5	2.18%	73	0.0947	13	6.30%	212	0.1016	21	3.02%	101	0.0976
6	3.74%	126	0.1052	14	6.23%	210	0.1006	22	4.31%	145	0.1012
7	6.64%	223	0.1052	15	5.21%	175	0.1019	23	2.31%	78	0.0953
8	4.79%	161	0.1022	16	3.82%	128	0.1000	24	0.80%	27	0.0945
								Total		3360.8	

2020 - Hourly Traffic Volumes Per Direction and DPM Emission rates- South King Road

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	4.05%	14	0.0731	9	6.42%	22	0.0778	17	5.37%	18	0.0827
2	2.72%	9	0.0559	10	7.31%	25	0.0797	18	3.11%	11	0.0657
3	3.06%	10	0.0489	11	6.42%	22	0.0785	19	2.31%	8	0.0680
4	3.51%	12	0.0839	12	6.95%	24	0.0792	20	0.85%	3	0.0716
5	2.30%	8	0.0719	13	6.09%	21	0.0818	21	3.07%	10	0.0759
6	3.43%	12	0.0878	14	6.10%	21	0.0803	22	4.18%	14	0.0812
7	6.10%	21	0.0878	15	5.01%	17	0.0823	23	2.42%	8	0.0727
8	4.59%	16	0.0828	16	3.77%	13	0.0793	24	0.85%	3	0.0716
								Total		339.3	

2025 - Hourly Traffic Volumes Per Direction and DPM Emission Rates- Hwy-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.82%	141	0.0759	9	6.42%	237	0.0785	17	5.75%	212	0.0802
2	2.12%	78	0.0660	10	7.56%	279	0.0791	18	2.72%	100	0.0721
3	2.09%	77	0.0600	11	6.46%	238	0.0788	19	2.03%	75	0.0729
4	3.56%	131	0.0808	12	7.03%	260	0.0791	20	0.77%	28	0.0755
5	2.09%	77	0.0757	13	6.49%	240	0.0799	21	3.00%	111	0.0771
6	3.75%	138	0.0823	14	6.35%	234	0.0793	22	4.27%	157	0.0798
7	6.60%	244	0.0823	15	5.34%	197	0.0803	23	2.43%	90	0.0759
8	4.75%	175	0.0805	16	3.80%	140	0.0786	24	0.79%	29	0.0736
								Total		3691.8	

2025 - Hourly Traffic Volumes Per Direction and DPM Emission rates- South King Road

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.98%	14	0.0612	9	6.40%	23	0.0653	17	5.56%	20	0.0682
2	2.58%	9	0.0481	10	7.46%	26	0.0662	18	3.02%	11	0.0556
3	2.77%	10	0.0419	11	6.40%	23	0.0658	19	2.23%	8	0.0568
4	3.40%	12	0.0693	12	6.93%	25	0.0663	20	0.81%	3	0.0605
5	2.19%	8	0.0607	13	6.31%	22	0.0676	21	3.07%	11	0.0630
6	3.48%	12	0.0721	14	6.24%	22	0.0666	22	4.15%	15	0.0676
7	6.13%	22	0.0721	15	5.15%	18	0.0685	23	2.54%	9	0.0611
8	4.57%	16	0.0687	16	3.78%	13	0.0655	24	0.86%	3	0.0576
								Total		355.0	

Table A3-2 – Hourly Traffic Volumes and PM2.5 Emission Rates: Highway 101 & South King Road

2015 - Hourly Traffic Volumes Per Direction and PM2.5 Emission Rates- Hwy-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.14%	1195	0.0262	9	7.09%	7465	0.0160	17	7.36%	7747	0.0140
2	0.39%	409	0.0316	10	4.35%	4575	0.0206	18	8.20%	8634	0.0123
3	0.34%	359	0.0362	11	4.64%	4883	0.0176	19	5.73%	6033	0.0122
4	0.25%	264	0.0851	12	5.87%	6185	0.0171	20	4.31%	4537	0.0118
5	0.48%	508	0.0309	13	6.17%	6493	0.0153	21	3.27%	3445	0.0143
6	0.89%	934	0.0358	14	6.03%	6353	0.0156	22	3.31%	3487	0.0161
7	3.81%	4011	0.0190	15	7.05%	7419	0.0142	23	2.46%	2592	0.0142
8	7.83%	8245	0.0129	16	7.16%	7538	0.0129	24	1.87%	1969	0.0119
								Total		105280	

2015 - Hourly Traffic Volumes Per Direction and PM2.5 Emission rates- South King Road

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.16%	97	0.0317	9	7.11%	597	0.0206	17	7.38%	620	0.0183
2	0.42%	35	0.0369	10	4.39%	369	0.0257	18	8.16%	686	0.0165
3	0.42%	35	0.0395	11	4.67%	392	0.0224	19	5.69%	478	0.0163
4	0.28%	23	0.0908	12	5.89%	494	0.0218	20	4.27%	359	0.0158
5	0.50%	42	0.0366	13	6.15%	517	0.0198	21	3.26%	274	0.0187
6	0.91%	77	0.0421	14	6.03%	507	0.0201	22	3.30%	277	0.0207
7	3.80%	319	0.0239	15	7.01%	589	0.0186	23	2.46%	206	0.0186
8	7.76%	652	0.0171	16	7.13%	599	0.0171	24	1.86%	156	0.0160
								Total		8400	

2020 - Hourly Traffic Volumes Per Direction and PM2.5 Emission Rates- Hwy-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.13%	1298	0.0205	9	7.09%	8136	0.0139	17	7.36%	8439	0.0125
2	0.39%	449	0.0249	10	4.35%	4985	0.0168	18	8.21%	9411	0.0115
3	0.33%	383	0.0268	11	4.64%	5316	0.0149	19	5.74%	6577	0.0114
4	0.25%	284	0.0585	12	5.88%	6742	0.0146	20	4.31%	4942	0.0111
5	0.48%	549	0.0234	13	6.17%	7073	0.0134	21	3.27%	3752	0.0127
6	0.88%	1012	0.0267	14	6.03%	6920	0.0136	22	3.31%	3799	0.0140
7	3.81%	4370	0.0158	15	7.05%	8080	0.0127	23	2.46%	2822	0.0127
8	7.83%	8981	0.0118	16	7.16%	8215	0.0119	24	1.87%	2147	0.0112
								Total		114680	

2020 - Hourly Traffic Volumes Per Direction and PM2.5 Emission rates- South King Road

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.15%	106	0.0247	9	7.11%	651	0.0180	17	7.38%	675	0.0166
2	0.42%	38	0.0288	10	4.39%	402	0.0210	18	8.17%	748	0.0155
3	0.41%	37	0.0298	11	4.67%	427	0.0190	19	5.70%	521	0.0154
4	0.27%	25	0.0603	12	5.89%	539	0.0187	20	4.27%	391	0.0150
5	0.50%	46	0.0275	13	6.15%	563	0.0174	21	3.26%	298	0.0167
6	0.91%	83	0.0308	14	6.03%	552	0.0176	22	3.30%	302	0.0180
7	3.80%	347	0.0199	15	7.01%	641	0.0167	23	2.46%	225	0.0167
8	7.76%	710	0.0158	16	7.13%	653	0.0159	24	1.87%	171	0.0152
								Total		9150	

2025 - Hourly Traffic Volumes Per Direction and PM2.5 Emission Rates- Hwy-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.13%	1403	0.0176	9	7.10%	8806	0.0130	17	7.36%	9136	0.0120
2	0.39%	488	0.0211	10	4.35%	5396	0.0151	18	8.21%	10181	0.0112
3	0.34%	417	0.0222	11	4.63%	5751	0.0136	19	5.73%	7109	0.0110
4	0.24%	302	0.0447	12	5.88%	7293	0.0135	20	4.31%	5346	0.0108
5	0.48%	591	0.0197	13	6.17%	7651	0.0126	21	3.27%	4057	0.0120
6	0.89%	1099	0.0223	14	6.04%	7494	0.0128	22	3.31%	4109	0.0129
7	3.80%	4721	0.0142	15	7.05%	8743	0.0120	23	2.47%	3059	0.0122
8	7.83%	9715	0.0114	16	7.17%	8891	0.0115	24	1.87%	2321	0.0108
								Total		124080	

2025 - Hourly Traffic Volumes Per Direction and PM2.5 Emission rates- South King Road

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.15%	114	0.0212	9	7.11%	704	0.0167	17	7.39%	732	0.0157
2	0.42%	42	0.0246	10	4.39%	434	0.0188	18	8.18%	809	0.0149
3	0.41%	40	0.0255	11	4.66%	462	0.0173	19	5.69%	564	0.0147
4	0.26%	26	0.0459	12	5.89%	583	0.0171	20	4.28%	423	0.0145
5	0.50%	49	0.0232	13	6.15%	609	0.0162	21	3.25%	322	0.0157
6	0.91%	90	0.0256	14	6.04%	598	0.0164	22	3.30%	326	0.0166
7	3.79%	375	0.0178	15	7.01%	694	0.0157	23	2.46%	244	0.0159
8	7.77%	769	0.0150	16	7.14%	707	0.0152	24	1.86%	185	0.0146
								Total		9900	

Attachment 4: Hourly Traffic Volumes for Highway 85 & Monterey Highway

Table A4-1 – Average Hourly Traffic Volume Distributions for DPM Analysis: Highway 85 and Monterey Highway

2015 - Hourly Traffic Volumes Per Direction - Highway 85

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	0.031	3	9	0.068	8	17	0.058	6
2	0.029	3	10	0.053	6	18	0.067	7
3	0.039	4	11	0.056	6	19	0.048	5
4	0.013	1	12	0.062	7	20	0.030	3
5	0.015	2	13	0.055	6	21	0.033	4
6	0.014	2	14	0.057	6	22	0.031	3
7	0.031	3	15	0.056	6	23	0.026	3
8	0.057	6	16	0.054	6	24	0.016	2
						Total		109.9

2015 - Hourly Traffic Volumes Per Direction - Monterey Highway

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	0.031	1	9	0.068	1	17	0.058	1
2	0.029	0	10	0.053	1	18	0.067	1
3	0.039	1	11	0.056	1	19	0.048	1
4	0.013	0	12	0.062	1	20	0.030	1
5	0.015	0	13	0.055	1	21	0.033	1
6	0.014	0	14	0.057	1	22	0.031	1
7	0.031	1	15	0.056	1	23	0.026	0
8	0.057	1	16	0.054	1	24	0.016	0
						Total		16.8

2025 - Hourly Traffic Volumes Per Direction - Highway 85

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	0.050	3	9	0.062	4	17	0.043	3
2	0.056	4	10	0.068	4	18	0.049	3
3	0.072	5	11	0.060	4	19	0.035	2
4	0.024	2	12	0.063	4	20	0.011	1
5	0.028	2	13	0.051	3	21	0.035	2
6	0.018	1	14	0.055	4	22	0.034	2
7	0.031	2	15	0.039	3	23	0.032	2
8	0.034	2	16	0.036	2	24	0.013	1
						Total		64.5

2025 - Hourly Traffic Volumes Per Direction - Monterey Highway

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	0.050	0	9	0.062	1	17	0.043	0
2	0.056	1	10	0.068	1	18	0.049	0
3	0.072	1	11	0.060	1	19	0.035	0
4	0.024	0	12	0.063	1	20	0.011	0
5	0.028	0	13	0.051	1	21	0.035	0
6	0.018	0	14	0.055	1	22	0.034	0
7	0.031	0	15	0.039	0	23	0.032	0
8	0.034	0	16	0.036	0	24	0.013	0
						Total		9.8

Table A4-2 – Average Hourly Traffic Volume Distributions for PM2.5 and TOG Analysis: Highway 85 and Monterey Highway

2015 - Hourly Traffic Volumes Per Direction - Highway 85

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	1.07%	489	9	7.06%	3244	17	7.41%	3401
2	0.35%	159	10	4.22%	1936	18	8.34%	3831
3	0.28%	128	11	4.58%	2102	19	5.84%	2681
4	0.15%	70	12	5.82%	2673	20	4.40%	2022
5	0.44%	200	13	6.18%	2837	21	3.30%	1514
6	0.79%	361	14	6.03%	2768	22	3.31%	1518
7	3.75%	1720	15	7.10%	3262	23	2.48%	1138
8	7.96%	3653	16	7.26%	3335	24	1.91%	876
						Total		45,920

2015 - Hourly Traffic Volumes Per Direction - Monterey Highway

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	1.07%	75	9	7.06%	494	17	7.41%	518
2	0.35%	24	10	4.22%	295	18	8.34%	584
3	0.28%	20	11	4.58%	320	19	5.84%	409
4	0.15%	11	12	5.82%	407	20	4.40%	308
5	0.44%	31	13	6.18%	432	21	3.30%	231
6	0.79%	55	14	6.03%	422	22	3.31%	231
7	3.75%	262	15	7.10%	497	23	2.48%	174
8	7.96%	557	16	7.26%	508	24	1.91%	134
						Total		7,000

2025 - Hourly Traffic Volumes Per Direction - Highway 85

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	1.06%	576	9	7.06%	3823	17	7.41%	4009
2	0.35%	188	10	4.22%	2283	18	8.34%	4516
3	0.28%	151	11	4.58%	2477	19	5.84%	3161
4	0.15%	83	12	5.82%	3151	20	4.40%	2383
5	0.43%	234	13	6.18%	3342	21	3.29%	1783
6	0.79%	425	14	6.03%	3264	22	3.31%	1789
7	3.74%	2026	15	7.10%	3844	23	2.48%	1342
8	7.96%	4307	16	7.26%	3931	24	1.91%	1033
						Total		54,120

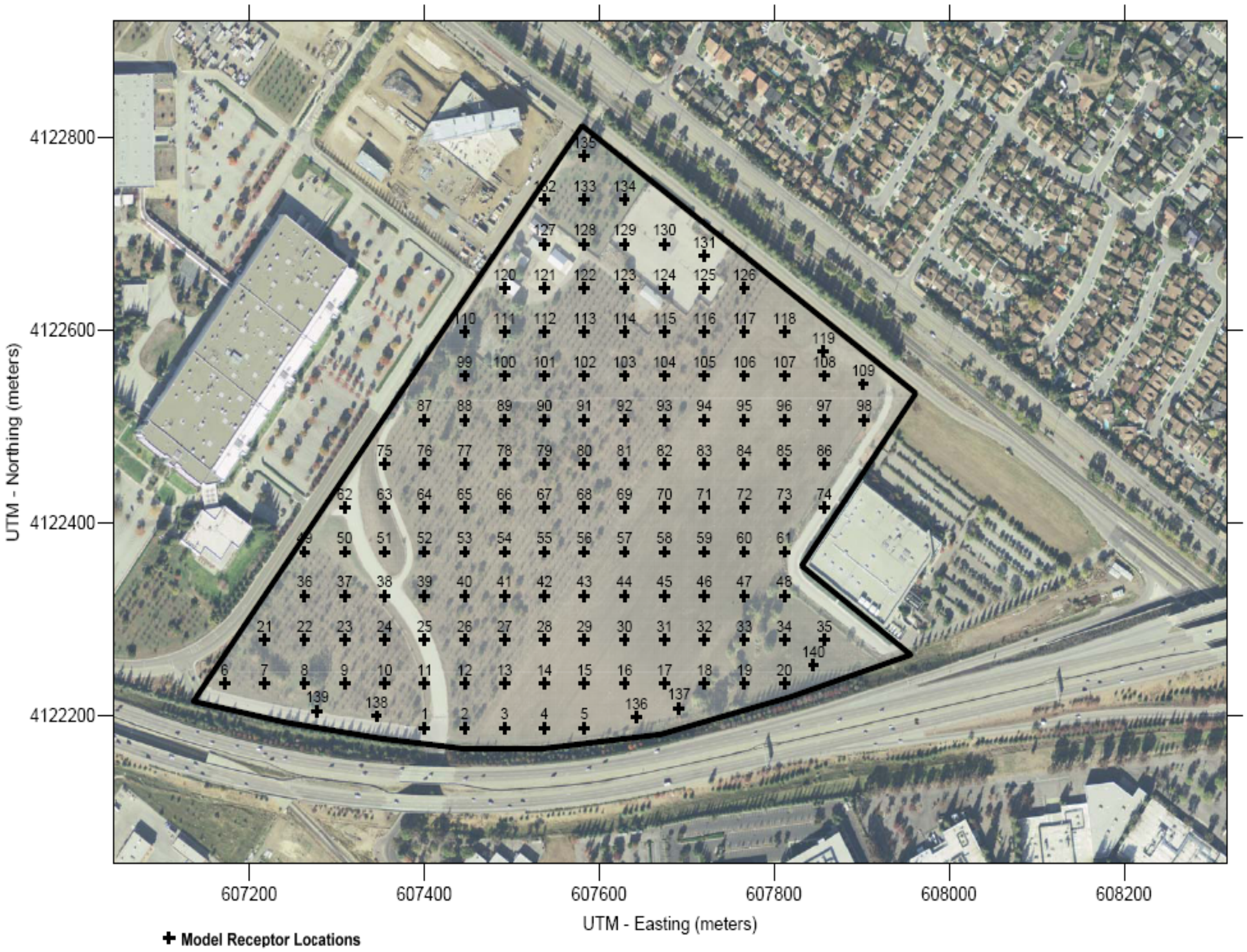
2025 - Hourly Traffic Volumes Per Direction - Monterey Highway

Hour	% Per Hour	VPH	Hour	% Per Hour	VPH	Hour	% Per Hour	VPH
1	1.06%	88	9	7.06%	583	17	7.41%	611
2	0.35%	29	10	4.22%	348	18	8.34%	688
3	0.28%	23	11	4.58%	378	19	5.84%	482
4	0.15%	13	12	5.82%	480	20	4.40%	363
5	0.43%	36	13	6.18%	509	21	3.29%	272
6	0.79%	65	14	6.03%	498	22	3.31%	273
7	3.74%	309	15	7.10%	586	23	2.48%	205
8	7.96%	656	16	7.26%	599	24	1.91%	157
						Total		8,250

Attachment 5: Modeling Receptor Locations

Figure A5-1 Rancho Del Pueblo Project Site and Modeling Receptor Locations

Figure A5-2 iStar Project Site and Modeling Receptor Locations



Attachment 6: Rail Line Information and DPM and $PM_{2.5}$ Emission Rates

Year	Description	No. Lanes	Link Width (ft)	Link Width (m)	Link Length (ft)	Link Length (miles)	Link Length (m)	Volume Vertical Dimension (m)	Release Height (m)	No. Trains per Day	Link Emission Rate (g/day)	Link Emission Rate (g/s)	Link Emission Rate (lb/hr)
2015	Trains on UPRR Rail Line	1	24	7.3	5,226	0.99	1,593	10	12	30	201.3	2.33E-03	1.85E-02
2025	Trains on UPRR Rail Line	1	24	7.3	5,226	0.99	1,593	10	12	30	80.5	9.32E-04	7.39E-03

Notes: Emission based on Emission Factors for Locomotives, USEPA 2009 (EPA-420-F-09-025)
DPM & PM2.5 calculated as 92% of PM emissions (CARB CEIDERS PM2.5 fractions)
2015 emissins caclculatted assume 30 trains per day, 3.400 hp locomotive engines, 65% load, 60 mph, and Tier 0+ emission factor of 0.20 g/hp-hr
2015 emissins caclculatted assume 30 trains per day, 3.400 hp locomotive engines, 65% load, 60 mph, and Tier 2+ emission factor of 0.08 g/hp-hr

Attachment 7: Modeling Parameters and maximum Cancer Risks for the Rancho Del Pueblo Site

Table A7-1 - CAL3QHCR Modeling Parameters and Maximum Cancer Risks From Traffic on South King Road

CAL3QHCR Risk Modeling Parameters and Maximum Cancer Risk in Project Area
Rancho del Pueblo - South King Road Traffic, San Jose, CA

Receptor Information

Number of Receptors	76
Receptor Height =	1.5 m
Receptor distances =	40 m

Meteorological Conditions

San Jose Airport Hourly Met Data	1992, 1993, 1994, 1995, and 1997
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air (μg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

	Value[1]							
Exposure Type	**DBR (L/kg BW-day)**	**A (-)**	**Exposure (hr/day)**	**Exposure (days/week)**	**Exposure (week/year)**	**EF (days/yr)**	**ED (Years)**	**AT (days)**
Residential (70-Year)	302	1	24	7	50	350	70	25,550

[1] Default values recommended by OEHHA& Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x CRAF x CPF x 10^6
= URF x Cair

Where: CPF = Cancer potency factor (mg/kg-day)$^{-1}$
CRAF = Cancer Risk Adjustment Factor
URF =Unit risk factor (cancer risk per μg/m^3)

Unit Risk Factors for DPM and Organic TACs from Vehicle TOG Exhaust & Evaporative Emissions

Exposure Type	**CPF (mg/kg-day)$^{-1}$**	**CRAF (-)**	***DPM***	**Exhaust TOG TACs**	**Evaporative TOG TACs**
Residential (70-Yr Exposure)	1.10E+00	1.7	541.53	3.1	0.18

MEI Cancer Risk Calculations From Roadways During Project Operation

Meteorological Data Year	**Maximum DPM Concentration (μg/m^3)**			**Maximum Exhaust TOG Concentration (μg/m3)**			**Maximum Evaporative TOG Concentration (μg/m3)**		
	2015	**2020**	**2025**	**2015**	**2020**	**2025**	**2015**	**2020**	**2025**
1992	0.0190	0.0120	0.0104	0.3058	0.2019	0.1532	0.2885	0.2538	0.2253
1993	0.0182	0.0115	0.0100	0.3011	0.1993	0.1515	0.2841	0.2505	0.2228
1994	0.0196	0.0124	0.0108	0.3251	0.2152	0.1636	0.3068	0.2705	0.2406
1995	0.0178	0.0113	0.0098	0.2963	0.1964	0.1493	0.2795	0.2468	0.2196
1997	0.0183	0.0116	0.0101	0.3072	0.2037	0.1550	0.2898	0.2561	0.2280
			-						
Average	0.0186	0.0117	0.0102	0.3071	0.2033	0.1545	0.2897	0.2555	0.2273
			-						
Cancer Risk[a]	10.1	6.4	5.5	0.9	0.6	0.5	0.1	0.0	0.04
70-yr Cumulative Risk[b]	5.91			0.52			0.04		

Total Risk From All TACs = 6.5 per million

Notes:
Receptor Heights = 1.5 m
Maximum DPM & TOG concentrations occur along northern boundary near South King Road (Receptor No. 75)
a Cancer risk (per million) calculated assuming constant 70-year exposure to concentration for year of analysis.
b Cumulative cancer risk (per million) calculated assuming variable exposure over a 70-year period due to decreased concentrations over time.

Table A7-2 – CAL3QHCR Modeling Parameters and Maximum Cancer Risks From Traffic on Highway 101

CAL3QHCR Risk Modeling Parameters and Maximum Cancer Risk in Project Area
Rancho del Pueblo - Hwy 101, San Jose, CA

Receptor Information

Number of Receptors	76
Receptor Height =	1.5 m
Receptor distances =	40 m

Meteorological Conditions

San Jose Airport Hourly Met Data	1992, 1993, 1994, 1995, and 1997
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air (μg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

Exposure Type	Value[1] DBR (L/kg BW-day)	A (-)	Exposure (hr/day)	Exposure (days/week)	Exposure (week/year)	EF (days/yr)	ED (Years)	AT (days)
Residential (70-Year)	302	1	24	7	50	350	70	25,550

[1] Default values recommended by OEHHA& Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x CRAF x CPF x 10^6
= URF x Cair

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
CRAF = Cancer Risk Adjustment Factor
URF =Unit risk factor (cancer risk per μg/m^3)

Unit Risk Factors for DPM and Organic TACs from Vehicle TOG Exhaust & Evaporative Emissions

Exposure Type	CPF $(mg/kg\text{-}day)^{-1}$	CRAF (-)	*DPM*	Exhaust TOG TACs	Evaporative TOG TACs
Residential (70-Yr Exposure)	1.10E+00	1.7	541.53	3.1	0.18

MEI Cancer Risk Calculations From Roadways During Project Operation

Meteorological Data Year	Maximum DPM Concentration (μg/m^3) 2015	2020	2025	Maximum Exhaust TOG Concentration (μg/m3) 2015	2020	2025	Maximum Evaporative TOG Concentration (μg/m3) 2015	2020	2025
1992	0.1423	0.0921	0.0796	1.5860	0.9769	0.7260	1.1791	1.0160	0.8869
1993	0.1594	0.1032	0.0891	1.7462	1.0736	0.7969	1.2982	1.1165	0.9734
1994	0.1589	0.1029	0.0888	1.7361	1.0672	0.7920	1.2907	1.1098	0.9675
1995	0.1509	0.0977	0.0843	1.6383	1.0059	0.7460	1.2180	1.0462	0.9114
1997	0.1486	0.0962	0.0830	1.5819	0.9684	0.7167	1.1760	1.0071	0.8756
			-						
Average	0.1520	0.0984	0.0850	1.6577	1.0184	0.7555	1.2324	1.0591	0.9230
			-						
Cancer Risk[a]	82.3	53.3	46.0	5.1	3.1	2.3	0.2	0.2	0.17
70-yr Cumulative Risk[b]	49.13			2.58			0.17		

Total Risk From All TACs = 51.9 per million

Notes:
Receptor Heights = 1.5 m
Maximum DPM & TOG concentrations occur along southern boundary near Highway 85 (Receptor No. 5)
a Cancer risk (per million) calculated assuming constant 70-year exposure to concentration for year of analysis.
b Cumulative cancer risk (per million) calculated assuming variable exposure over a 70-year period due to decreased concentrations over time.

Attachment 8: Modeling Parameters and maximum Cancer Risks for the iStar Site

Table A8-1 - CAL3QHCR Modeling Parameters and Maximum Cancer Risks From Roadways – Highway 85 and the Monterey Highway

CAL3QHCR Risk Modeling Parameters and Maximum Cancer Risk in Project Area
iStar Development, San Jose, CA

Receptor Information

Number of Receptors	140
Receptor Height =	1.5 m
Receptor distances =	approx 40 m

Meteorological Conditions

San Jose Airport Hourly Met Data	1992, 1993, 1994, 1995, and 1997
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

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)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

	Value[1]							
Exposure Type	**DBR (L/kg BW-day)**	**A (-)**	**Exposure (hr/day)**	**Exposure (days/week)**	**Exposure (week/year)**	**EF (days/yr)**	**ED (Years)**	**AT (days)**
Residential (70-Year)	302	1	24	7	50	350	70	25,550

[1] Default values recommended by OEHHA& Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x CRAF x CPF x 10^6
= URF x Cair

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
CRAF = Cancer Risk Adjustment Factor
URF =Unit risk factor (cancer risk per $\mu g/m^3$)

Unit Risk Factors for DPM and Organic TACs from Vehicle TOG Exhaust & Evaporative Emissions

Exposure Type	**CPF $(mg/kg\text{-}day)^{-1}$**	**CRAF (-)**	***DPM***	**Exhaust TOG TACs**	**Evaporative TOG TACs**
Residential (70-Yr Exposure)	1.10E+00	1.7	541.5	3.1	0.18

MEI Cancer Risk Calculations From Roadways During Project Operation

Meteorological Data Year	**Maximum DPM Concentration ($\mu g/m^3$)**			**Maximum Exhaust TOG Concentration (μg/m3)**			**Maximum Evaporative TOG Concentration (μg/m3)**		
	2015	**2025**	**-**	**2015**	**2025**	**-**	**2015**	**2025**	**-**
1992	0.0018	0.0008	-	0.6147	0.2965	-	0.6933	0.5565	-
1993	0.0021	0.0010	-	0.7112	0.3431	-	0.8022	0.6440	-
1994	0.0021	0.0009	-	0.6858	0.3308	-	0.7736	0.6209	-
1995	0.0020	0.0009	-	0.6655	0.3211	-	0.7507	0.6026	-
1997	0.0019	0.0009	-	0.6153	0.2967	-	0.6940	0.5569	-
			-						
Average	0.0020	0.0009	-	0.6585	0.3177	-	0.7428	0.5962	-
			-						
Cancer Risk[a]	1.1	0.5	-	2.0	1.0	-	0.1	0.1	-
70-yr Cumulative Risk[b]	0.57			1.13			0.11		

Total Risk From All TACs = 1.8 per million

Notes:
Receptor Heights = 1.5 m
Maximum DPM & TOG concentrations occur along southern boundary near Highway 85 (Receptor No. 5)
a Cancer risk (per million) calculated assuming constant 70-year exposure to concentration for year of analysis.
b Cumulative cancer risk (per million) calculated assuming variable exposure over a 70-year period due to decreased concentrations over time.

Table A8-2 - Maximum Cancer Risks from Locomotives on the UPRR Rail Line

DPM Cancer Risk from Locomotives
iStar Development, San Jose, CA

Receptor Information

Number of Receptors	140	
Receptor Height =	1.5 m	
Receptor distances =	approx 45 m	(~ 150 ft)

Meteorological Conditions

San Jose Airport Hourly Met Data	1992, 1993, 1994, 1995, and 1997
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Cancer Risk Calculations From Locomotives on Rail Line

Meteorological Data Year	Maximum DPM Concentration (μg/m^3) 2015	2025	-
1992	0.0229	0.0092	-
1993	0.0214	0.0086	-
1994	0.0239	0.0096	-
1995	0.0216	0.0087	-
1997	0.0221	0.0089	-
			-
Average	0.0224	0.0090	-
			-
Cancer Risk[a]	12.1	4.9	-
70-yr Cumulative Risk[b]	**5.89**		

Notes:
Receptor Heights = 1.5 m
Maximum DPM concentrations occur along the northern boundary near Grat Oaks Blvd (Receptor No. 135)
a Cancer risk (per million) calculated assuming constant 70-year exposure to concentration for year of analysis.
b Cumulative cancer risk (per million) calculated assuming variable exposure over a 70-year period due to decreased concentrations over time.