4.2 Air Quality

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, which affects air quality.

4.2.1 Environmental Setting

Regional Topography, Meteorology, and Climate

The potential for high pollutant concentrations to develop at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the air pollutants. The atmospheric pollution potential, as the term is used in this EIR, is independent of the location of emission sources and is instead a function of factors such as topography and meteorology.

The El Camino Real/Downtown Specific Plan is located in the City of Menlo Park in San Mateo County, California, which falls within the boundaries of the San Francisco Bay Area Air Basin (Basin). The Basin encompasses the nine-county regions including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties. Within the Basin, 11 subregions have been defined based on their unique climatology and topography.

The Plan area is located in the southeastern portion of the Peninsula subregion. This subregion stretches from San Jose to the Golden Gate and is bounded by the Pacific Ocean to the west and by the San Francisco Bay to the east. The prevailing winds for most of this area are from the west. The air pollution potential is highest along the southeastern portion of the Peninsula near the Plan area. This is largely because this area is protected from high winds and fog of the marine layer. Major sources of air pollution in this subregion include a number of industrial sources and traffic congestion on major roadways and freeways.[1]

Temperatures have a narrow range due to the proximity of the moderating marine area; maximum summer temperatures average in the high-70's, with lows in the mid-50's. Winter highs are in the mid-50's to the low-60's, with lows in the high-30's to the low-40's.[2]

1 Bay Area Air Quality Management District (BAAQMD), Ambient Air Quality Standards and Bay Area Attainment, http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, accessed August 10, 2010.

2 Based on historical weather data from the Western Regional Climate Center (WRCC) for the adjacent community of Palo Alto because WRCC does not have data for Menlo Park. Western Regional Climate Center (WRCC), Monthly Climate Summary for Palo Alto, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6646, accessed August 10, 2010.

Existing Air Quality

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with jurisdiction over the nine-county region located in the Basin. BAAQMD operates a regional monitoring network that measures the ambient concentrations of criteria pollutants. Existing levels of air quality in the Plan area can generally be inferred from ambient air quality measurements conducted by BAAQMD at its closest station, which is the Redwood City Station.

Background ambient concentrations of pollutants are determined by pollutant emissions in a given area as well as wind patterns and meteorological conditions for that area. As a result, background concentrations can vary among different locations within an area. However, areas located close together and exposed to similar wind conditions can be expected to have similar background pollutant concentrations. **Table 4.2-1** shows a five-year (2005 – 2009) summary of monitoring data collected at the Redwood City monitoring station. The criteria air pollutants are described in more detail in Section, 4.2.2, *Regulatory Setting*, below. The data are compared with the California Ambient Air Quality Standards and the National Ambient Air Quality Standards that are currently applicable.

As shown in the table below, the state one- and eight-hour and the national eight-hour ozone standards have not been exceeded at the Redwood City monitoring station since 2005. However, the State 24-hour PM_{10} standard and national $PM_{2.5}$ 24-hour standard were both exceeded a number of times between 2005 and 2009.

Sensitive Receptors

For the purposes of air quality and public health and safety, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust and air pollutant concentrations, or other disruptions associated with project construction and/or operation. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are sometimes considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system. On the other hand, the amount of time that individuals spend in parks and other recreation areas tends to be much less than the time spent at home, and so exposure duration and frequency to pollutants is correspondingly less substantial. Sensitive receptors in the plan area include residential uses. Nearby sensitive receptors include the residential neighborhoods north, south, and west of downtown, and east of the Caltrain station and Alma Street. Four city parks, Fremont Park, Nealon Park, Burgess Park (Civic Center) and Holbrook Palmer Park, are within two blocks of the Plan area.

TABLE 4.2-1
AIR QUALITY DATA SUMMARY (2005–2009) FOR THE PLAN AREA

Pollutant	Standard	Monitoring Data by Year				
		2005	2006	2007	2008	2009
Ozone						
Highest One-Hour Average (ppm)	0.09	0.084	0.085	0.077	0.082	0.087
Days over State Standard		0	0	0	0	0
Highest Eight-Hour Average (ppm)		0.061	0.063	0.069	0.069	0.063
Days over State Standard	0.070	0	0	0	0	0
Days over National Standard	0.075	0	0	0	0	0
Respirable Particulate Matter (PM_{10})						
Highest 24-Hour Average ($\mu g/m^3$)[a]	50	80.8	69.9	55.8	41.0	NA
Estimated Days over State Standard[b]		**10.2**	**10.2**	**6.0**	NA	NA
Estimated Days over National Standard[b]	150	0	0	0	NA	NA
Annual Average		20.9	19.8	19.6	NA	NA
Exceed State Standard?	20	**Yes**	No	No	NA	NA
Fine Particulate Matter ($PM_{2.5}$)						
Highest 24-Hour Average ($\mu g/m^3$)[c]	35	30.9	75.3	45.4	27.9	31.7
Estimated Days over National Standard[b]		0	**2.6**	**2.9**	0	0
Annual Average	12	8.8	9.6	8.3	9.1	8.7
Exceed State Standard?		No	No	No	No	No

NOTES: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; NA = insufficient data to determine the value
Bold face indicates exceedance.

[a] Statistics shown represent State statistics and are based on California approved samplers. These may differ from national statistics which are based on different samplers.
[b] Measurements are usually collected every six days. Estimated days over the standard represent the estimated number of days the standard would have been exceeded if measurements were collected every day.
[c] Statistics shown represent national statistics and are based on samplers using federal reference or equivalent methods. National statistics are presented for $PM_{2.5}$ rather than State statistics as there is no 24-hour State $PM_{2.5}$ standard.

SOURCE: CARB, 2009.

4.2.2 Regulatory Setting

Air quality within the Basin is addressed through the efforts of various federal, State, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern and agencies primarily responsible for improving the air quality within the Basin and the pertinent regulations are discussed below.

Criteria Air Pollutants

Regulation of air pollution is achieved through both national and State ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) has identified criteria pollutants and has established national ambient air quality standards to protect public health and

welfare. National standards have been established for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), and lead. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.[3]

To protect human health and the environment, the EPA has set "primary" and "secondary" maximum ambient thresholds for each of the criteria pollutants. Primary thresholds were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

The national standards are defined as the maximum acceptable concentration that may be reached, but not exceeded more than once per year. California has adopted more stringent ambient air quality standards for most of the criteria air pollutants. **Table 4.2-2** presents both sets of ambient air quality standards (i.e., national and State) and the Basin's attainment status for each standard.

California has also established State ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride. Sulfates, the fully oxidized ionic form of sulfur, are formed when sulfur dioxide (SO_2) is oxidized in the atmosphere. Hydrogen sulfide is formed during bacterial decomposition of sulfur-containing substances and can be present in sewer gas and some natural gas. Hydrogen sulfide can also be emitted as a result of geothermal energy exploitation. Most vinyl chloride is associated with production of polyvinyl chloride (PVC) plastic and vinyl products; it has also been detected near landfills, sewage plants and hazardous waste sites due to microbial breakdown of chlorinated solvents. The Specific Plan would not include any activities that would result in direct emissions of sulfates, hydrogen sulfide and/or vinyl chloride, nor does the area contain existing emitters of these compounds, and thus, there is no further mention of these pollutants in this EIR.

As shown in Table 4.2-2, the nine-county Bay Area Basin is currently classified as non-attainment for the one-hour State ozone standard as well as non-attainment for the federal and State eight-hour standards.[4] Additionally, the Basin is classified as non-attainment for State 24-hour and annual arithmetic mean PM_{10} standards as well as the State annual arithmetic mean and the national 24-hour $PM_{2.5}$ standards. The Basin is unclassified or classified as attainment for all other pollutants standards (BAAQMD, 2010).[5]

[3] U.S. Environmental Protection Agency (EPA), 2008. Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive and Marin Compression Ignition Engines Less than 30 Liters Per Cylinder – Table 3-82 – Control Case PM2.5 Emissions for Locomotives, March 2008.

[4] As explained below in the discussion of applicable regulations, areas designated non-attainment for a pollutant generally must prepare an air quality plan to demonstrate a means of achieving attainment status.

[5] "Unclassified" status means that data for a pollutant are incomplete and do not support a designation of attainment or non-attainment status. Bay Area Air Quality Management District (BAAQMD), Ambient Air Quality Standards and Bay Area Attainment, http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, accessed August 10, 2010.

TABLE 4.2-2
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard		National Standard	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone	One Hour	0.09 ppm	Non-attainment	–	–
	Eight Hour	0.07 ppm	Non-attainment	0.075 ppm	Non-Attainment
Carbon Monoxide	One Hour	20 ppm	Attainment	35 ppm	Attainment
	Eight Hour	9.0 ppm	Attainment	9 ppm	Attainment
Nitrogen Dioxide	One Hour	0.18 ppm	Attainment	0.1 ppm	Unclassified
	Annual	0.030 ppm	Not applicable	0.053 ppm	Attainment
Sulfur Dioxide	One Hour	0.25 ppm	Attainment	–	–
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment
	Annual	–	–	0.03 ppm	Attainment
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Non-Attainment	150 µg/m^3	Unclassified
	Annual	20 µg/m^3	Non-Attainment	–	–
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	–	–	35 µg/m^3	Non-Attainment
	Annual	12 µg/m^3	Non-Attainment	15 µg/m^3	Attainment
Lead	Monthly	1.5 µg/m^3	Attainment	–	–
	Quarterly	–	–	1.5 µg/m^3	Attainment

NOTES: ppm = parts per million, µg/m^3 = micrograms per cubic meter; dash (–) indicates no standard for that jurisdiction.

SOURCE: BAAQMD, 2010.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide (CO)

CO is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air

temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Nitrogen Dioxide (NO_2)

NO_2 is an air quality pollutant of concern because it acts as a respiratory irritant. NO_2 is a major component of the group of gaseous nitrogen compounds commonly referred to as oxides of nitrogen (NOx). NOx is a precursor to ozone formation and is produced by fuel combustion in motor vehicles, industrial stationary sources (such as industrial activities), ships, aircraft, and rail transit. Typically, NOx emitted from fuel combustion is in the form of nitric oxide (NO) and nitrogen dioxide (NO_2). NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere.

Particulate Matter

PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. 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 demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. According to a recent study by California Air Resources Board (CARB), exposure to $PM_{2.5}$ from 2004 through 2006 can be associated with an average of approximately 18,000 premature annual deaths statewide. Particulates can also damage materials and reduce visibility.[6]

Other Criteria Pollutants

Sulfur dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (both PM_{10} and $PM_{2.5}$) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead, substantially reducing its health effects.

Toxic Air Contaminants

Toxic air contaminants are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Potential human health effects of toxic air contaminants include birth defects, neurological damage, cancer, and death. There are hundreds of different types of toxic air contaminants with varying degrees of toxicity. Individual toxic air

6 California Air Resources Board (CARB), Methodology for Estimating Premature Deaths Associated with Long-Term Exposure to Fine Airborne Particulate Matter in California, page 39, October 24, 2008.

contaminants vary greatly in the health risk they present; at a given level of exposure, one toxic air contaminant may pose a hazard that is many times greater than another.

Toxic air contaminants do not have ambient air quality standards, but are regulated by the BAAQMD using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances, to provide quantitative estimates of health risks.[7]

In addition to monitoring criteria pollutants, both the BAAQMD and the Air Resources Board (ARB) operate toxic air contaminant monitoring networks in the San Francisco Bay Area. These stations measure 10 to 15 toxic air contaminants, depending on the specific station. The toxic air contaminants selected for monitoring are those that have traditionally been found in the highest concentrations in ambient air, and therefore tend to produce the most significant risk. The BAAQMD operates an ambient toxic air contaminant monitoring station in Redwood City.

Diesel Particulate Matter

The State Air Resources Board identified diesel particulate matter (DPM) as a toxic air contaminant in 1998, primarily based on evidence demonstrating cancer effects in humans.[8] The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways. The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. ARB estimated the average Bay Area cancer risk from diesel particulate, based on a population-weighted average ambient diesel particulate concentration, at about 480 in one million, as of 2000. The risk from diesel particulate matter declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, ARB estimated the average statewide cancer risk from DPM at 540 in one million.[9,10]

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7 In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk, then the applicant is subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, calculating the increased risk of cancer as a result of exposure to one or more TACs.

8 California Air Resources Board, Fact Sheet, "The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines." October 1998. Available on the internet at: http://www.arb.ca.gov/toxics/dieseltac/factsht1.pdf. This document is also available for review at the Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2006.1524E.

9 California Air Resources Board, *California Almanac of Emissions and Air Quality - 2009 Edition*, Table 5-44 and p. 5-44. Available on the internet at: http://www.arb.ca.gov/aqd/almanac/almanac09/pdf/chap509.pdf. Viewed October 24, 2009.

10 This calculated cancer risk values from ambient air exposure in the Bay Area can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which is more than 40 percent (based on a sampling of 17 regions nationwide), or greater than 400,000 in one million, according to the National Cancer Institute.

Recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. The ARB community health risk assessments and regulatory programs have produced air quality information about certain types of facilities for consideration by local authorities when siting new residences, schools, day care centers, parks and playgrounds, and medical facilities (i.e., sensitive land uses). Sensitive land uses deserve special attention because children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the non-cancer effects of air pollution. There is also substantial evidence that children are more sensitive to cancer-causing chemicals.[11]

In 2000, the ARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. As part of the Plan, the ARB in 2008 approved a new regulation for existing heavy-duty diesel vehicles that will require retrofitting and replacement of vehicles (or their engines) over time such that by 2023, all vehicles must have a 2010 model year engine or equivalent. The regulation is anticipated to result in an 80 percent decrease in statewide diesel health risk in 2020 from the 2000 risk.[12] Additional regulations apply to new trucks and to diesel fuel. With new controls and fuel requirements, 60 trucks built in 2007 would have the same soot exhaust emissions as one truck built in 1988.[13] Despite these reductions, the ARB recommends that proximity to sources of DPM emissions be considered in the siting of new sensitive land uses (e.g., residences, schools, daycare centers, playgrounds, or medical facilities). The ARB notes that these recommendations are advisory and should not be interpreted as defined "buffer zones," and that local agencies must balance other considerations, including housing and transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. With careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, ARB's position is that infill development, mixed use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.[14]

Applicable Regulations

Federal

The EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the national ambient air quality standards and judging the adequacy of State Implementation Plans, but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

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11 California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective,* April 2005. Available on the internet at: http://www.arb.ca.gov/ch/handbook.pdf.

12 California Air Resources Board, "Overview of Truck and Bus Regulation Reducing Emissions from Existing Diesel Vehicles," fact sheet, February 25, 2009; and "Facts About Truck and Bus Regulation Emissions Reductions and Health Benefits," fact sheet, February 25, 2009. available on the internet at: http://www.arb.ca.gov/msprog/onrdiesel/documents.htm. Reviewed October 24, 2009.

13 Pollution Engineering, *New Diesel Fuel Rules Start,* website accessed on October 30, 2006: http://www.pollutioneng.com/CDA/.

14 California Air Resources Board, *Air Quality and Land Use Handbook*; see footnote 11.

State

The California Air Resources Board (CARB) is responsible for establishing and reviewing the State standards, compiling the California State Implementation Plan and securing approval of that plan from the EPA, conducting research and planning, and identifying toxic air contaminants (TACs). CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the county or regional level. County or regional air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act.

Local

Bay Area Air Quality Management District (BAAQMD)

BAAQMD is the regional agency with jurisdiction over the nine-county region located in the Basin. The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC), county transportation agencies, cities and counties, and various non-governmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs.

BAAQMD is responsible for bringing and/or maintaining air quality in the Basin within federal and State air quality standards. Specifically, BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the Basin and to develop and implement strategies to attain the applicable federal and State standards.

In 1999, BAAQMD adopted its *CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*, as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. These BAAQMD Guidelines were revised and updated in June 2010, as the *BAAQMD CEQA Air Quality Guidelines*.

The 2010 *BAAQMD CEQA Air Quality Guidelines* is an advisory document and local jurisdictions are not required to utilize the methodology outlined therein.[15] The document describes the criteria that BAAQMD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for use in determining whether projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts. In practice, most local agencies rely on the *BAAQMD CEQA Air Quality Guidelines* when assessing the significance of air quality impacts.

[15] Bay Area Air Quality Management District (BAAQMD), *California Environmental Quality Act (CEQA) Air Quality Guidelines*, June 2010; http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_June%202010.ashx; accessed August 14, 2010.

Air quality plans developed to meet federal requirements are referred to as State implementation Plans. The federal Clean Air Act and the California Clean Air Act require plans to be developed for areas designated as non-attainment (with the exception of areas designated as non-attainment for the State particulate matter standards plans for which are not required by California Code of Regulations). In March 2010, BAAQMD published the draft *Bay Area 2010 Clean Air Plan*, which replaces the existing *Bay Area 2005 Ozone Strategy*; the 2010 Plan was adopted in September 2010. This plan includes ozone control measures and also considers the impacts of these control measures on particulate matter (PM), air toxics, and Greenhouse Gas Emissions (GHGs) in a single, integrated plan.

The *2010 Clean Air Plan* explains how the Basin will achieve compliance with the State one-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The Strategy also discusses related air quality issues of interest including the BAAQMD's public involvement process, climate change, fine particulate matter, BAAQMD's Community Air Risk Evaluation program, local benefits of ozone control measures, the environmental review process, national ozone standards, and photochemical modeling.

4.2.3 Impacts and Mitigation Measures

Significance Criteria

Implementation of the Specific Plan would be considered to have significant air quality impacts if it would:

- Conflict with or obstruct implementation of the applicable air quality plan(s);
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Approach to Analysis

As discussed previously, BAAQMD in June 2010 adopted its revised *CEQA Air Quality Guidelines* (BAAQMD Guidelines). The BAAQMD Guidelines recommend that the assessment of operational air quality impacts associated with local plans, including specific plans, evaluate whether the plan in question is consistent with the most recently adopted air quality plan for the Bay Area. The Guidelines include the following two metrics for determining significance of criteria pollutant emissions impacts from local plans: (1) consistency with the so-called "control measures" contained

in the current regional air quality plan; and (2) the projected rate of increase in vehicle miles traveled or vehicle trips would be less than or equal to projected population increase.

With respect to potential toxic air contaminants (TACs), the BAAQMD recommends that overlay zones be established around existing and proposed land uses that emit TACs. These overlay zones should be included in proposed plan policies, land use maps, and implementing ordinances. Given that the Specific Plan would locate new residents within 500 feet of existing sources of toxic air contaminants, including diesel particulate matter from Caltrain diesel-powered engines and truck traffic on major arterials such as El Camino Real, and also within 500 feet of existing sources of $PM_{2.5}$ from high-volume roadways, the Plan would not provide the recommended overlay zones. Therefore, for the purpose of this analysis, impacts associated with toxic air contaminants were evaluated using the quantitative thresholds developed for assessing project-level impacts as described in the BAAQMD Guidelines for project-specific impacts. According to these thresholds, exposure to toxic air contaminants and $PM_{2.5}$ would be considered significant if:

1. Probability of contracting cancer for the Maximally Exposed Individual (MEI)[16] from an individual source exceeds 10 in one million;

2. Cumulative probability of contracting cancer for the MEI from all sources within 1,000 feet exceeds 100 in one million;

3. Acute or chronic non-cancer hazard indices for the MEI from all sources within 1,000 feet exceeds 1.0;

4. Annual average ambient $PM_{2.5}$ concentrations from an individual source exceeds 0.3 micrograms per cubic meter at the MEI;

5. Cumulative annual average ambient $PM_{2.5}$ concentrations from all sources within 1,000 feet exceed 0.8 micrograms per cubic meter at the MEI.

For odors, a plan must identify the location of existing and planned odor sources in the plan area. The plan must also include policies to reduce potential odor impacts in the plan area. Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, auto body shops, rendering plants, and coffee roasting facilities. Given that the Specific Plan would not permit these types of facilities and would not locate sensitive receptors within close proximity to these types of facilities outside the Plan area, it can be assumed that no odor impact would occur. Therefore, impacts related to odor are not discussed further in this EIR.

[16] MEI is the Maximally Exposed Individual, which represents the worst-case risk estimate based on a theoretical person continuously exposed for 70 years at the point of highest compound concentration in air.

Impacts

Impact AIR-1: Implementation of the Specific Plan would result in increased long-term emissions of criteria pollutants associated with construction activities that could contribute substantially to an air quality violation. (Significant)

Implementation of the Specific Plan would allow for development of approximately 330,000 square feet of retail and commercial development, 680 residential units, and 380 hotel rooms over a 30-year timeframe. Furthermore, the Specific Plan would include infrastructure improvements such as sidewalk improvements and new bicycle and pedestrian connections. Such development would require demolition and removal of existing structures, grading, and site preparation and construction of new structures. Emissions generated during construction activities would include exhaust emissions from heavy duty construction equipment, trucks used to haul construction materials to and from sites, worker vehicle emissions, as well as fugitive dust emissions associated with earth disturbing activities.

The BAAQMD Guidelines do not include a threshold of significance for evaluating construction related impacts at the Plan level. Instead, subsequent individual development projects in the Plan area would be required to meet thresholds of significance for criteria pollutant emissions associated with construction equipment exhaust. The project-specific construction thresholds are 54 lbs per day of reactive organic gases, nitrogen oxides, and $PM_{2.5}$ (exhaust only) and 82 pounds per day for PM_{10} (exhaust only). The BAAQMD Guidelines also contain health-based standards for exposure to toxic air contaminants that are the same as those for project operations, described above on page 4.2-11.

BAAQMD has proposed screening thresholds that would allow most of the projects constructed under the Specific Plan to be deemed to have less-than-significant construction emissions without a detailed air quality analysis. Examples of projects that would be considered less than significant under BAAQMD's screening approach are presented in **Table 4.2-3** below. In addition to the project size requirements shown in Table 4.2-3, projects would also be required to include all "Basic Construction Mitigation Measures" as defined in the BAAQMD proposed guidelines. It is noted that the proposed screening thresholds do not consider effects of demolition of existing structures or projects for which construction schedules call for overlapping construction phases (e.g., paving and building construction occurring simultaneously) that could result in greater emissions than assumed by default assumptions used by the so-called URBan EMISsions (URBEMIS) air quality model. Therefore, some subsequent development projects, including some that do not exceed the screening thresholds presented in Table 4.2-3, would require a detailed air quality analysis that demonstrates compliance with applicable guidelines at the time of development.

Given that detailed construction information, such as construction techniques and scheduling, that would be utilized for each individual development project is not currently known, estimation of emissions from individual development projects would be too speculative to warrant evaluation. However, implementation of Mitigation Measure AIR-1a would require implementation of standard fugitive dust control measures in order to ensure that impacts from fugitive dust would be less than significant.

TABLE 4.2-3
BAAQMD ADOPTED CONSTRUCTION RELATED CRITERIA AIR POLLUTANT AND OZONE PRECURSOR SCREELING LEVEL SIZES

Land use Type	Construction-Related Screening Size
Single Family	114 dwelling units
Apartment, low-rise; Apartment, mid-rise; Condo/townhouse, general; Congregate care facility	240 dwelling units
Apartment, high rise	249 dwelling units
Condo/townhouse, high-rise	252 dwelling units
Mobile home park; Retirement community	114 dwelling units
Elementary school	277,000 square feet or 3904 students
Junior high school	277,000 square feet or 3261 students
High school; Junior college; University/College	277,000 square feet or 3012 students
Day-care center; Library; Place of worship; Racquet club; Racquetball/ health; Quality restaurant; High turnover restaurant; Fast food restaurant; Free standing discount store; Discount club; Regional shopping center; Electronic superstore; Home improvement store; Strip mall; Hardware/ paint store; Supermarket; Convenience market; Bank; General office building; Office park; Government office building; Pharmacy/drugstore; Medical office building	277,000 square feet
City park	67 acres
Hotel; Motel	554 rooms
Hospital	277,000 square feet or 337 beds
Warehouse	259,000 square feet or 11 acres
General light industry	259,000 square feet, 11 acres or 540 employees
General heavy industry	259,000 square feet or 11 acres
Industrial park	259,000 square feet, 11 acres or 577 employees
Manufacturing	259,000 square feet

SOURCE: BAAQMD, 2010.

Due to the uncertainty in construction activities that would result from implementation of the Specific Plan, it is conceivable that one or more of the subsequent development projects under the Specific Plan could trigger project level significant construction exhaust emissions impacts under the 2010 BAAQMD Guidelines significance thresholds for construction exhaust. Therefore, impacts associated with construction equipment exhaust emissions that would result under implementation of the Specific Plan are considered significant.

Nonetheless, implementation of Mitigation Measure AIR-1b would ensure that construction exhaust emissions would be reduced to the maximum extent feasible. It should be noted that the identification of this program level potentially significant impact does not preclude the finding of future less-than-significant impacts for subsequent projects that comply with BAAQMD screening criteria or meet applicable thresholds of significance.

Mitigation Measure AIR-1a: During construction of individual projects under the Specific Plan, project applicants shall require the construction contractor(s) to implement the following measures required as part of Bay Area Air Quality Management District's (BAAQMD) basic dust control procedures required for construction sites. For projects for which construction emissions exceed one or more of the applicable BAAQMD thresholds, additional measures shall be required as indicated in the list following the Basic Controls.

Basic Controls that Apply to All Construction Sites

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4. All vehicle speeds on unpaved roads shall be limited to 15 mph.

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Additional Measures for Development Projects that Exceed Significance Criteria

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.

2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.

3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.

4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.

5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.

6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.

7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.

8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.

9. Minimizing the idling time of diesel powered construction equipment to two minutes.

10. The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent nitrogen oxides reduction and 45 percent particulate matter reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

11. Use low volatile organic compound (VOC) (i.e., reactive organic gases) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).

12. Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of nitrogen oxides and particulate matter.

13. Requiring all contractors use equipment that meets the California Air Resources Board's most recent certification standard for off-road heavy duty diesel engines.

Mitigation Measure AIR-1b: Each applicant for development projects to be implemented under the Specific Plan for projects that exceed the BAAQMD screening criteria shall develop an Exhaust Emissions Control Plan outlining how construction exhaust emissions will be controlled during construction activities. These plans shall be submitted to the City for review and approval and shall be distributed to all employees and construction contractors prior to commencement of construction activities. The plan shall describe all feasible control measures that will be implemented during construction activities. Feasible control measures may include, but not be limited to, those identified in Mitigation Measure AIR-1a.

Even with mitigation, it is possible that one or more larger subsequent development projects would result in a significant, unavoidable impact with respect to emissions during construction. Therefore, for purposes of a conservative analysis, the impact is considered significant and unavoidable, with respect to criteria pollutant emissions from construction equipment exhaust.

Significance after Mitigation: Significant and Unavoidable.

Impact AIR-2: Implementation of the Specific Plan would result in increased long-term emissions of criteria pollutants from increased vehicle traffic and on-site area sources that would contribute substantially to an air quality violation. (Significant)

The most recently adopted air quality plan in the San Francisco Bay Area Air Basin is the *2010 Clean Air Plan*. The *2010 Clean Air Plan* is a roadmap showing how the San Francisco Bay Area will achieve compliance with the state one-hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the MTC, local governments, transit agencies, and others. The *2010 Clean Air Plan* also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the state one-hour ozone standard. In this, the *2010 Clean Air Plan* replaces the *2005 Ozone Strategy*. Under BAAQMD's methodology, a determination of consistency with the most recently adopted Clean Air Plan ("CAP"), currently the 2010 CAP, must demonstrate that a plan or project not exceed the population or vehicle miles traveled ("VMT") assumptions contained in the CAP and that the project or plan implements transportation control measures ("TCMs") as applicable.

Criterion 1: Population Growth and Vehicle Miles Traveled Consistency

For a project to be consistent with the CAP, BAAQMD requires that the projected increase in VMT associated with a proposed project be less than the projected population increase. Because project vehicle trips would be distributed not just to Menlo Park, percentage increases of VMT and population are compared on a countywide basis because available VMT estimates are inventories on a countywide basis, not a citywide basis.

The Metropolitan Transportation Commission (MTC) maintains an inventory of population VMT for the region and by county,[17] the latest version of which was published in 2008. The population estimates of the MTC cite a 2035 San Mateo county region-wide population of 861,600. As discussed in Section 4.11, *Population and Housing*, of this EIR, development under the Specific Plan would result in a population increase of approximately 1,537 persons. This represents a regional population increase of 0.18 percent.

According to the *El Camino Real/Downtown Specific Plan Transportation Impact Analysis* presented in Appendix E, the Specific Plan would increase daily VMT by approximately 90,000 miles per day. The MTC maintains an inventory of VMT for the region and by county.[18] For 2035, MTC data shows VMT for San Mateo County of 19,657,142 miles. The addition of

[17] http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035-Travel_Forecast_Data_Summary.pdf
[18] http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035-Travel_Forecast_Data_Summary.pdf

project-related VMT to the 2035 forecast results in a total increase of 0.46 percent in the VMT for the proposed Specific Plan.

Consequently, the rate of increase in VMT (0.46 percent) would be more than the rate of increase in population (0.18 percent) for the proposed Specific Plan and would be considered inconsistent with the population and VMT assumptions of the CAP.

Criterion 2: Plan consistency with Transportation Control Measures contained in the Clean Air Plan

Air pollutant emissions are a function of human activity. The 1988 California Clean Air Act, Section 40919(d) requires regions to implement "transportation control measures to substantially reduce the rate of increase in passenger vehicle trips and miles traveled."

The *Bay Area 2010 Clean Air Plan* (CAP) contains 59 control measures aimed at reducing air pollution in the Bay Area. Many (18) of these measures address stationary sources and will be implemented by BAAQMD using its permit authority and are therefore not suited to implementation through local planning efforts. Sixteen other measures are a draft list of measures for further study and are not yet identified as feasible for implementation under the 2010 CAP. The remaining 25 measures are identified in **Table 4.2-4**. This table identifies each Control Strategy and correlates it to specific elements of the Specific Plan or explains why the Strategy does not apply to the proposed Specific Plan. Therefore, the proposed Specific Plan would be consistent with the Control Strategies contained in the 2010 CAP for the San Francisco Bay Area Air Basin.

Table 4.2-4 shows that the proposed Specific Plan would not disrupt or hinder implementation of any CAP control measures. BAAQMD has identified examples of how a Plan may cause the disruption or delay of control measures, such as a project that may preclude an extension of a transit line or bike path or proposes excessive parking beyond parking requirements. Section F.6 of the Specific Plan calls for accommodation of new and improved bus rapid transit service and shuttle service. Section F.3 and F.4 of the Specific Plan provide for improved pedestrian and

bicycle facilities. Section F.9 of the Specific Plan addresses limiting parking demand in the Specific Plan area. The Specific Plan does not limit any transit extension. These elements of the Specific Plan demonstrate that control measure disruption or delay would not occur under the proposed Specific Plan.

> **Mitigation:** Mitigation Measure TR-2 of Section 4.13, *Transportation, Circulation and Parking*, identifies Transportation Demand Management (TDM) strategies to be implemented by individual project applicants, although the precise effectiveness of a TDM program cannot be guaranteed. As the transportation demand management strategies included in Mitigation Measure TR-2 represent the majority of available measures with which to reduce VMT, no further mitigation measures are available and this impact is considered to be significant and unavoidable.
>
> **Significance after Mitigation:** Significant and Unavoidable.

TABLE 4.2-4
CONTROL STRATEGIES OF THE 2010 CLEAN AIR PLAN

2010 CAP Control Strategy	Elements of the Proposed Project Consistent with the Strategy or Explanation of Non-applicability
Transportation Control Measures	
TCM A: Improve Transit Services	Section F.6 of the Specific Plan addresses how the Plan supports transit services including accommodation of bus rapid transit service and increasing shuttle service.
TCM B: Improve System Efficiency	Not Applicable: This measure addresses infrastructure improvements to increase operational efficiencies on freeways and transit service (such as common fare payment systems) and are geared toward regional transit agencies and CALTRANS and not local government.
TCM C: Encourage Sustainable Travel Behavior (i.e., voluntary employer-based trip reduction program)	Section F.10 of the Specific Plan proposed requiring all new developments to establish a Transportation Demand Management (TDM) program or pay an in-lieu impact fee. Developers may choose from a menu of TDM strategies including subsidies for site users who use transit or alternative modes of transportation.
TCM D: Support Focused Growth (Bicycle and Pedestrian friendliness)	Alternative transportation modes are addressed in Sections F.3 and F.4 of the Specific Plan. These sections include such elements as sidewalk extensions and special crossing treatments to create a more pedestrian friendly network. Additionally, the Specific Plan establishes a comprehensive bicycle network for the area.
TCM E: Implement Pricing Strategies	Parking pricing strategies are addressed in Section F.9 of the Specific Plan and include possible implementation of a metered parking system.
Mobile Source Control Measures	
MSM A-1: Promote Clean Fuel Efficient Vehicles	Section F.10 of the Specific Plan identifies preferential parking for alternative fueled vehicles as one potential element of a TDM program that would be required of all new developments.
MSM A-2: Zero Emission Vehicles	Section F.10 of the Specific Plan identifies neighborhood electric vehicle programs to reduce the need to have a car or second car vehicles as one potential element of a TDM program that would be required of all new developments.
MSM A-3: Green Fleets	Not Applicable: Development of the Plan Area would generally be retail, commercial or residential in nature and unlikely to accommodate a land use requiring a fleet of vehicles. However, a green fleet could be used by a developer as a TDM program required under Section F.10 of the Specific Plan.
MSM A-4: Replacement or Repair of High-emitting Vehicles	Not Applicable: This Strategy addresses vehicle buy-back programs implemented by BAAQMD.
MSM B-1: Fleet Modernization for Medium and Heavy-Duty Trucks	Not Applicable: This Strategy addresses incentive programs for truck modernization which are implemented by BAAQMD or CARB.
MSM B-2: Low NOx retrofits in Heavy-Duty Trucks	Not Applicable: This Strategy addresses cash incentives for retrofits which are implemented by BAAQMD or CARB.
MSM B-3: Efficient Drive Trains	Not Applicable: This Strategy addresses development and demonstration programs in partnership with CARB and the California Energy Commission.
MSM C-1: Construction and Farming Equipment	Not Applicable: This Strategy addresses cash incentives for retrofits which are implemented by BAAQMD or CARB.
MSM C-2: Lawn & Garden Equipment	Not Applicable: This Strategy addresses voluntary exchange programs implemented by BAAQMD.
MSM C-3: Recreational Vessels	Not Applicable: This Strategy addresses voluntary exchange programs implemented by BAAQMD.

TABLE 4.2-4 (Continued)
CONTROL STRATEGIES OF THE 2010 CLEAN AIR PLAN

2010 CAP Control Strategy	Elements of the Proposed Project Consistent with the Strategy or Explanation of Non-applicability
Land Use & Local Impact Measures	
LUM 1: Goods Movement	Not Applicable: The City of Menlo Park has a truck route map that promotes truck travel away from constrained routes and concentrated sensitive receptors.
LUM 2: Indirect Source Review Rule	Not Applicable: This Strategy addresses implementation of an indirect source Rule by BAAQMD.
LUM 3: Updated CEQA Guidelines	This Strategy addresses updating of the CEQA Guidelines by BAAQMD (adopted in June 2010 and applied in this analysis).
LUM 4: Land Use Guidance	This strategy addresses updating land use planning documents such as the proposed Specific Plan and demonstrating consistency with air quality protection guidance such as the new BAAQMD CEQA Guidelines that are applied in this analysis.
LUM 5: Reduce Health Risk in Impacted Communities	The Project area is generally developed with commercial, retail and residential uses and would not be considered to be an "impacted" community with regard to airborne health risk exposure. However, Caltrain operations through the Specific Plan area are a source of diesel particulate matter. Mitigation Measure AIR-5 discussed latter in this section addresses potential exposure to new residential developments potentially constructed under the Specific Plan.
LUM 6: Enhanced Air Quality Monitoring	Not Applicable: This Strategy addresses air quality monitoring that is the purview of BAAQMD and/or CARB.
Energy & Climate Measures	
ECM 1: Energy Efficiency	Section E.3.8.3 of the Specific Plan identifies sustainable building strategies to be incorporated into future development including LEED certification and guidelines addressing solar access, storm water and wastewater management, landscaping, lighting and green building materials.
ECM 2: Renewable Energy	See measure ECM-1 above.
ECM 3: Urban Heat Island Mitigation	As stated on page C-18 of the Specific Plan: The downtown concept reinforces and enhances the overall tree canopy to provide shade and to mitigate for heat island effects.
ECM 4: Shade Tree Planting	As stated on page C-4 of the Specific Plan: Provide continuity and consistency along the corridor with coordinated streetscape elements and regular street tree planting as private improvements take place.

SOURCE: Environmental Science Associates, 2010.

Impact AIR-3: Implementation of the Specific Plan would increase levels of project generated toxic air contaminants (TACs) which may lead to adverse health effects. (Less than Significant)

Implementation of the Specific Plan would increase vehicle trip generation, a percentage of which would include heavy duty truck traffic which is a major source of diesel particulate matter (DPM). DPM is a carcinogen of concern and also has chronic non-cancer effects on the respiratory system and can increase the frequency and intensity of asthma attacks.

The roadway segment with the greatest increase in average daily trips from implementation of the Specific Plan would be along El Camino Real. BAAQMD has generated screening tables to assess risks from DPM along major freeways and highways, which include El Camino Real.

The maximum existing incremental cancer risk from exposure to DPM concentrations along El Camino Real is calculated by BAAQMD to be 20 in one million[19] and is based on an assumed 2-way daily traffic volume of 49,000 vehicles per day. This risk is calculated for a distance of 100 feet from the edge of the roadway. The risk drops substantially with distance, to 0.69 per million at a distance of 200 feet. The proposed project would increase roadway volumes along this segment of El Camino Real by up to 401 vehicles per hour or approximately 4,000 vehicles per day. This represents an increase is mobile source emissions increase of approximately 8.2 percent with a commensurate increase in cancer risk from DPM of approximately 1.64 in one million. This is less than the BAAQMD significance criterion of 10 in one million; therefore project impacts would be less than significant along El Camino Real requiring no mitigation.

In addition to cancer risk, DPM has non-cancer chronic effects on the respiratory system. The non-cancer adverse health risk for chronic (long-term) exposure, is measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentration from emissions to a published reference exposure level (REL) that could cause adverse health effects as established by the Office of Environmental Health Hazard Assessment. Using the same method as for determination of cancer risk, the project related hazard index is estimated to be 0.011, which is well under the significance threshold of 1.0 and hazard index impacts along El Camino Real would be less than significant.

The health risks posed by Plan-generated traffic on other roadways in and near the Plan area would be less than that on El Camino Real, and thus would also be less than significant.

Mitigation: None required.

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[19] BAAQMD, Road and Highway Screening Tables, October 26, 2010, available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx

Impact AIR-4: Implementation of the Specific Plan would expose persons to increased levels of project generated $PM_{2.5}$ which may lead to adverse health effects. (Less than Significant)

Total $PM_{2.5}$ concentrations at the maximum exposed individual were modeled similarly to diesel particulate matter concentrations as discussed under Impact AIR-3; however, in addition to truck traffic, $PM_{2.5}$ emissions from light weight vehicles and from tire and brake wear were also included in these calculations. Based on modeling results, concentrations from Plan-generated traffic would be approximately 0.023 micrograms per cubic meter ($\mu g/m^3$) along El Camino Real. This is well below the BAAQMD draft threshold of 0.3 $\mu g/m^3$; therefore, impacts would be less than significant. $PM_{2.5}$ concentrations from Plan-generated traffic on other roadways would be lower, and would also be less than significant.

Mitigation: None required.

Impact AIR-5: Implementation of the Specific Plan would locate sensitive receptors in an area of elevated concentrations of toxic air contaminants associated with roadway traffic which may lead to considerable adverse health effects. (Potentially Significant)

The Specific Plan would locate new residential receptors near high volume roadways that would have a percentage of diesel truck traffic. The Specific Plan would also potentially locate new residential receptors near El Camino Real, which is a source of diesel particulate matter (DPM). BAAQMD has generated screening tables to assess risks from DPM along major freeways and highways, which include El Camino Real. The maximum existing incremental cancer risk from exposure to DPM concentrations along El Camino Real is calculated by BAAQMD to be 20 in one million[20] and is based on an assumed two-way daily traffic volume of 49,000 vehicles per day. This risk is calculated for a distance of 100 feet from the edge of the roadway. The risk drops substantially with distance to 0.69 per million at a distance of 200 feet. The proposed project would increase cancer risk from 20 in one million to 21.6 in one million.

In order to reduce maximum incremental cancer risks to less than 10 in one million, residential units in the Plan area within 200 feet of the edge of El Camino Real would have to implement Mitigation Measure AIR-5, which would require installation of air filtration systems in new residential units to reduce DPM levels.

The chronic non-cancer hazard index from vehicle traffic on El Camino Real at the maximally exposed receptor is 0.48 and would be less than the BAAQMD significance threshold for hazard indices of 1.0 and be less than significant.

Table 4.13-9 in Section 4.13, *Transportation, Circulation and Parking,* indicates that other streets in the Plan area have daily traffic volumes in excess of 10,000 vehicles, which is the BAAQMD's

[20] BAAQMD, Road and Highway Screening Tables, October 26, 2010, available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx

recommended screening threshold, below which traffic is assumed to not result in local health risks. These streets include Ravenswood Avenue, Oak Grove Avenue east of El Camino Real, and a small portion of Santa Cruz Avenue in the Plan area, west of University Avenue. All of these streets have volumes considerably lower than that on El Camino Real, and thus uses along these streets would be subject to proportionately less risk than those adjacent to El Camino Real, although risks at certain project sites could be significant.

Implementation of Mitigation Measure AIR-5, however, would reduce the impacts of health risk from DPM to a less-than-significant level.

> **Mitigation Measure AIR-5:** The final Specific Plan shall include an overlay zone, as recommended by BAAQMD, of 200 feet on either side of the outermost traffic lane of El Camino Real. The overlay zone shall require that all residential and/or mixed use developments including sensitive receptors such as residential units that is proposed within the Plan area that would be located within 200 feet of the edge of El Camino Real or within 100 feet of the edge of Ravenswood Avenue, Oak Grove Avenue east of El Camino Real, or Santa Cruz Avenue west of University Avenue shall undergo, prior to project approval, a screening-level health risk analysis to determine if cancer risk, hazard index, and/or $PM_{2.5}$ concentration would exceed BAAQMD thresholds. If one or more thresholds would be exceeded at the site of the subsequent project, the project (or portion of the project containing sensitive receptors, in the case of a mixed-use project) shall be equipped with filtration systems with a Minimum Efficiency Reporting Value (MERV) rating of 14 or higher. The ventilation system shall be designed by an engineer certified by the American Society of Heating, Refrigeration and Air-Conditioning Engineers, who shall provide a written report documenting that the system offers the best available technology to minimize outdoor to indoor transmission of air pollution. The project sponsor shall present a plan to ensure ongoing maintenance of ventilation and filtration systems and shall ensure the disclosure to buyers and/or renters regarding the findings of the analysis and inform occupants as to proper use of any installed air filtration. Alternatively, if the project applicant can prove at the time of development that health risks at new residences due to DPM (and other TACs, if applicable) would be less than 10 in one million, or less than any other threshold of significance adopted by BAAQMD for health risks, or that alternative mitigation measures reduce health risks below any other adopted threshold of significance, such filtration shall not be required.

According to American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 52.2 Test Procedures, filters that fall into the Minimum Efficiency Reporting Value (MERV) rating of 14 or higher reduce DPM levels by approximately 85 percent. If residential units are equipped with filtration systems meeting a MERV 14 rating, with control efficiency of 85 percent or greater, the maximum cancer risks from DPM associated with El Camino truck traffic would be reduced to 3.2 in one million; therefore, impacts would be less than significant with implementation of Mitigation Measure AIR-5.

> **Significance after Mitigation:** Less than Significant.

Impact AIR-6: Implementation of the Specific Plan would locate new sensitive receptors in an area of elevated concentrations of $PM_{2.5}$ associated with roadway traffic which may lead to considerable adverse health effects. (Potentially Significant)

The Specific Plan would locate new residential receptors near high volume roadways. All vehicles including light duty automobiles and diesel trucks generate $PM_{2.5}$ emissions from engine exhaust as well as from entrained road dust and tire and brake wear. BAAQMD has generated screening tables to assess annual average $PM_{2.5}$ concentrations from vehicle traffic along major freeways and highways, which include El Camino Real. The maximum existing annual average $PM_{2.5}$ concentration along El Camino Real is calculated by BAAQMD to be 0.48 $\mu g/m^3$ (micrograms per cubic meter) at a distance of 100 feet from the edge of the roadway. Exposure to this concentration would exceed the BAAQMD individual source threshold of 0.3 $\mu g/m^3$ and represent a significant $PM_{2.5}$ exposure impact. At 200 feet from El Camino Real this concentration would be reduced to 0.20 $\mu g/m^3$ and be less than significant. Other streets noted in Table 4.13-9 in Section 4.13, *Transportation, Circulation and Parking*, also have traffic volumes in excess of 10,000 vehicles per day and subsequent development sites along these streets could be subject to elevated concentrations of $PM_{2.5}$, although the concentrations would be lower than those along El Camino Real.

Mitigation Measure AIR-5 associated with Impact AIR-5 regarding DPM exposure would also reduce $PM_{2.5}$ exposure impacts along El Camino Real and other high-volume streets to a less than significant level.

Significance after Mitigation: Less than Significant.

Impact AIR-7: Implementation of the Specific Plan would expose sensitive receptors to elevated concentrations of Toxic Air Contaminants (TACs) associated with Caltrain operations which may lead to considerable adverse health effects. (Potentially Significant)

The Specific Plan would locate new residential receptors near the Caltrain line, which is a substantial source of diesel particulate matter (DPM). As discussed under Impact AIR-3, DPM is a carcinogen of concern and also has chronic non-cancer effects on the respiratory system and can increase the frequency and intensity of asthma attacks.

Caltrain emissions were evaluated to determine the exposure risk to Plan area residents, relying on data from the California Air Resources Board and EPA, including locomotive emissions standards adopted by the EPA in 2008 that are anticipated to reduce fine particulate emissions from locomotives by more than 80 percent by the year 2040, compared to 2008 levels.[21] The analysis is described in detail in Appendix C.

[21] Although High Speed Rail trains may use the Caltrain right-of-way, no local emissions were assumed for these trains as they would be electric rather than diesel driven.

Annual average DPM concentrations from locomotives were modeled using the EPA dispersion model AERMOD, and considered both moving trains and trains idling at the Caltrain station. Based on modeling results, the highest concentration of DPM would be approximately 0.16 $\mu g/m^3$ (micrograms per cubic meter) and would occur 50 feet east (downwind) of the track centerline near the Menlo Park Caltrain Station. The maximum incremental cancer risk from exposure to DPM was calculated to be 50.9 in one million, for an outdoor location, while the indoor risk level would be about one-third lower, or about 33.9 in one million.[22] This is substantially in excess of significance criterion of 10 in one million.

In order to reduce maximum incremental cancer risks to less than 10 in one million, residential units in the Plan area to the east of the Caltrain tracks, as well as residential uses west of and within approximately 960 feet of the edge of the railroad right-of-way would have to implement Mitigation Measure AIR-7, which would require installation of air filtration systems in new residential units to reduce DPM levels.

In addition to cancer risk, DPM has non-cancer chronic effects on the respiratory system. The non-cancer adverse health risk for chronic (long-term) exposure, is measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentration from emissions to a published reference exposure level that could cause adverse health effects as established by the Office of Environmental Health Hazard Assessment. The hazard index was calculated to be 0.032 (see Appendix C for calculations), which is well under the significance threshold of 1.0 and impacts would be less than significant even without implementation of Mitigation Measure AIR-7.

It is important to note that the Caltrain 2025 Project would provide for the conversion of diesel-hauled to electric-hauled trains. There would be a limited number of diesel locomotive operations for certain passenger routes; however, Caltrain has estimated that the electrification project would reduce air pollutant emissions from trains by approximately 90 percent. If electrification is implemented, this reduction would lessen cancer risk from DPM in the Plan area to less than 10 in one million, even without implementation of Mitigation Measure AIR-7.

In terms of stationary sources of TACs, review of BAAQMD data reveals no individual sources (such as dry cleaners, gas stations, or diesel backup generators) within or proximate to the Plan area that generate TAC concentrations in excess of BAAQMD thresholds.

> **Mitigation Measure AIR-7:** The final Specific Plan shall include an overlay zone, as recommended by BAAQMD, of 200 feet on either side of the outermost traffic lane of El Camino Real. The overlay zone shall require that all residential and/or mixed use developments including sensitive receptors such as residential units that is to be constructed within the Plan area that would be located within approximately 960 feet of the edge of the Caltrain right-of-way shall undergo, prior to project approval, a screening-level health risk analysis to determine if cancer risk, hazard index, and/or $PM_{2.5}$ concentration would exceed BAAQMD thresholds. If one or more thresholds would be exceeded at the site of the

[22] Studies by CARB indicate that people spend 90 percent of their time indoors, and that total exposure levels of particulate matter in residences without any filtration for incoming air are about one third lower than levels outside.

subsequent project, the project (or portion of the project containing sensitive receptors, in the case of a mixed-use project) shall be equipped with filtration systems with a Minimum Efficiency Reporting Value (MERV) rating of 14 or higher. The ventilation system shall be designed by an engineer certified by the American Society of Heating, Refrigeration and Air-Conditioning Engineers, who shall provide a written report documenting that the system offers the best available technology to minimize outdoor to indoor transmission of air pollution. The project sponsor shall present a plan to ensure ongoing maintenance of ventilation and filtration systems and shall ensure the disclosure to buyers and/or renters regarding the findings of the analysis and inform occupants as to proper use of any installed air filtration. Alternatively, if the project applicant can prove at the time of development that health risks at new residences due to DPM (and other TACs, if applicable) would be less than 10 in one million, or less than any other threshold of significance adopted by BAAQMD for health risks, or that alternative mitigation measures reduce health risks below any other adopted threshold of significance, such filtration shall not be required.

According to American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 52.2 Test Procedures, filters that fall into the Minimum Efficiency Reporting Value (MERV) rating of 14 or higher reduce DPM levels by approximately 85 percent. If residential units are equipped with filtration systems meeting a MERV 14 rating, with control efficiency of 85 percent or greater, the maximum cancer risks from DPM associated with Caltrain operations would be reduced to 7.6 in one million; therefore, impacts would be less than significant with implementation of Mitigation Measure AIR-7.

Significance after Mitigation: Less than Significant.

Impact AIR-8: Implementation of the Specific Plan would expose new sensitive receptors to elevated concentrations of $PM_{2.5}$ associated with Caltrain operations which may lead to considerable adverse health effects. (Less than Significant)

In the analysis presented under Impact AIR-7, it was assumed that all $PM_{2.5}$ emissions from locomotives would be diesel particulate matter (DPM); therefore, estimated DPM concentrations can be used to represent $PM_{2.5}$ concentrations as well. As discussed under Impact AIR-7, annual average DPM concentrations at the maximally exposed individual (MEI) would be approximately 0.16 $\mu g/m^3$ (micrograms per cubic meter). This is less than the proposed threshold of significance for $PM_{2.5}$ concentrations from individual sources of 0.3 $\mu g/m^3$; therefore, $PM_{2.5}$ impacts from rail operations would be less than significant.

Mitigation: None required.

Cumulative Impacts

The 2010 BAAQMD Guidelines recommend that Plan-level impacts be assessed based on consistency with growth assumptions of the current Air Quality Plan for the purposes of assessing cumulative impacts. However, this analysis includes not only an assessment of growth consistency but also includes a cumulative analysis of DPM and $PM_{2.5}$ exposure. The BAAQMD thresholds of significance discussed previously are designed to determine whether pollutant emissions are cumulatively considerable, because uses of the type included in the Specific Plan do not generate enough emissions to be individually significant.

Impact AIR-9: The Specific Plan is fundamentally consistent with the growth assumptions of the *Bay Area 2010 Clean Air Plan*. (Less than Significant)

The Specific Plan is anticipated to house approximately 1,500 net new residents (refer to Impact POP-2 of Section 4.11, *Population and Housing*) at build-out. However, given that ABAG projects a residential increase in the Menlo Park sphere of influence of 1,500 residents by 2010 and 2,600 between 2010 and 2020, and that Menlo Park is otherwise fairly fully developed, it can be assumed that the Specific Plan is generally consistent with growth projections for the area. Therefore, implementation of the Specific Plan would not induce substantial population growth that would conflict with the assumptions in the 2010 Clean Air Plan and impacts would be less than significant.

Mitigation: None required.

Impact AIR-10: Implementation of the Specific Plan would locate new sensitive receptors near sources of toxic air contaminants which may lead to cumulatively considerable adverse health effects. (Potentially Significant)

Major sources of diesel particulate matter (DPM) in the Plan area include Caltrain locomotives as well as diesel fueled trucks traveling along roadways within the project area. Diesel particulate matter can result in increased cancer risk as well as chronic non cancer exposure hazards. With regard to increased cancer risks, as discussed under Impact AIR-7, individual risk from exposure to diesel particulate matter associated with the Caltrain line would be approximately 50.9 in one million at the maximally exposed individual level without mitigation. Risk associated with roadway traffic, as discussed under Impact AIR-5, would not exceed 21.6 in one million at the maximally exposed individual level. Therefore, cumulative risk in the project area would be approximately 72.5 in one million which would not exceed the BAAQMD recommended threshold of 100 in one million. Therefore, cumulative health risk in the project area would be less than significant requiring no mitigation. However, as discussed under Impact AIR-5, implementation of Mitigation Measures AIR-5 and AIR-7 would be required to reduce risk from traffic-generated pollutants to a less-than-significant level. Implementation of this measure would subsequently reduce maximum cumulative risk to less than 10.9 in one million, which is well below the cumulative threshold of 100 in one million.

The cumulative non-cancer hazard index from exposure to diesel particulate matter would be less than 0.034 from rail operations of Caltrain and 0.48 from roadway traffic on El Camino Real. Assuming the maximum impacted rail receptors are the same as the maximally impacted roadway receptors, the cumulative hazard index would be 0.514. This is less than the cumulative BAAQMD significance threshold of 10.0; therefore, cumulative non-cancer risk from exposure to diesel particulate matter would also be less than significant.

As stated under Impact AIR-7, BAAQMD data indicate that there are no stationary sources of TACs within or proximate to the Plan area that generate TAC concentrations in excess of BAAQMD thresholds. The SRI International facility on Ravenswood Avenue has several diesel generators at various locations on its campus, as well as other permitted sources of TACs, including incinerators and a spray painting booth. Because the nearest portion of the SRI campus is approximately 800 feet from the Plan area, cumulative impacts are less likely than for a closer facility. However, implementation of Mitigation Measure AIR-10 would ensure that potential cumulative health risks would be less than significant.

> **Measure AIR-10:** The final Specific Plan shall include an overlay zone of 1,000 feet around the SRI International campus. The overlay zone shall require that all residential and/or mixed use developments including sensitive receptors such as residential units that is to be constructed within the Plan area that would be located within the zone undergo, prior to project approval, a screening-level health risk analysis to determine if cancer risk, hazard index, and/or $PM_{2.5}$ concentration would exceed BAAQMD thresholds. If one or more thresholds would be exceeded at the site of the subsequent project, the project (or portion of the project containing sensitive receptors, in the case of a mixed-use project) shall be equipped with filtration systems with a Minimum Efficiency Reporting Value (MERV) rating of 14 or higher. The ventilation system shall be designed by an engineer certified by the American Society of Heating, Refrigeration and Air-Conditioning Engineers, who shall provide a written report documenting that the system offers the best available technology to minimize outdoor to indoor transmission of air pollution. The project sponsor shall present a plan to ensure ongoing maintenance of ventilation and filtration systems and shall ensure the disclosure to buyers and/or renters regarding the findings of the analysis and inform occupants as to proper use of any installed air filtration.
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> **Significance after Mitigation:** Less than Significant.

Impact AIR-11: Implementation of the Specific Plan would locate new sensitive receptors near sources of $PM_{2.5}$ which may lead to cumulatively considerable adverse health effects. (Less than Significant)

Major sources of $PM_{2.5}$ in the Plan area include Caltrain locomotives as well as vehicle traffic traveling along roadways within the project area. As discussed under Impact AIR-8, annual average $PM_{2.5}$ concentrations associated with Caltrain operations at the maximally exposed individual level would be approximately 0.16 $\mu g/m^3$ (micrograms per cubic meter). Annual average $PM_{2.5}$ concentrations from vehicle traffic on El Camino Real estimated in Impact AIR-6 would be approximately 0.48 $\mu g/m^3$ at the maximally exposed individual. Therefore, it can be

assumed that cumulative concentrations in the project area, without mitigation, would be approximately 0.64 µg/m^3 which would not exceed the BAAQMD recommended threshold of 0.8 µg/m^3; therefore, cumulative impacts would be less than significant. With implementation of Mitigation Measures AIR-5 and AIR-7, cumulative concentrations would be approximately 0.10 µg/m^3, which is considerably less than the cumulative threshold of 0.8 µg/m^3.

Mitigation: None required.
