

## **G. AIR QUALITY**

This section provides an overview of the existing air quality conditions, a summary of currently applicable and draft proposed regulations, and an analysis of the potential short-term and long-term air quality impacts associated with implementation of the proposed project. The methods of analysis for short-term construction, long-term regional (operational), local mobile source, odors, and toxic air contaminant (TAC) emissions are consistent with the current recommendations of the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (ARB). Mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

### ***ENVIRONMENTAL SETTING***

The project site is located in the City and County of San Francisco, which is within the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB also includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, as well as the southern portion of Sonoma County and the southwest portion of Solano County. Ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors which affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Existing air quality conditions in the project area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources. The environmental factors and pollutant sources that affect ambient air pollutant concentrations are discussed separately.

### **TOPOGRAPHY, METEOROLOGY, AND CLIMATE**

The SFBAAB covers approximately 5,540 square miles of complex terrain consisting of coastal mountain ranges, inland valleys, and San Francisco Bay. The SFBAAB is generally bounded on the west by the Pacific Ocean, on the north by the Coast Ranges, and on the east and south by the Diablo Range.

The climate is dominated by a strong, semi-permanent, subtropical high-pressure cell over the northeastern Pacific Ocean. Climate is also affected by the moderating effects of the adjacent oceanic heat reservoir. Mild summers and winters, moderate rainfall and humidity, and daytime onshore breezes characterize regional climatic conditions in the San Francisco Bay Area (Bay Area). In summer, when the high-pressure cell is strongest and farthest north, fog forms in the morning, and temperatures are mild. In winter, when the high-pressure cell is weakest and farthest south, occasional rainstorms occur.

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Regional wind flow patterns affect air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions, such as moderate winds, disperse pollutants and reduce pollutant concentrations. When a warm layer of air traps cooler air close to the ground, an inversion is produced that traps air pollutants near the ground. Inversions occur in the project area during summer mornings and afternoons. During summer's long daylight hours, plentiful sunshine fuels photochemical reactions between nitrogen oxides (NO<sub>x</sub>) and reactive organic gases (ROG) that result in ozone formation. Often in summer, as the Central Valley heats up, the cooler marine layer is drawn into San Francisco in late morning and in the afternoon. As a result, pollutants are transported away from the City as fog forms.

In the winter, temperature inversions dominate during the night and early morning hours but frequently dissipate by afternoon. At night during the winter, the greatest pollution problems are from carbon monoxide (CO) and NO<sub>x</sub>. High CO concentrations occur on winter days with strong surface inversions and light winds, which result in extremely limited CO transport.

The local climate of the project area is represented by measurements recorded at the San Francisco Mission Dolores station, located about 2.25 miles to the southwest of the project site. The region receives an average of 21.1 inches of precipitation per year, which primarily occurs during the months of October through April.<sup>1</sup> Off-season rains (May through September) account for approximately 5 percent of the annual average. Average maximum summer temperatures range from 63 to 69 degrees Fahrenheit (°F) and fog is common. Average minimum wintertime temperatures range from 45 to 51°F.<sup>2</sup>

### **EXISTING AIR QUALITY – CRITERIA AIR POLLUTANTS**

ARB and the U.S. Environmental Protection Agency (EPA) focus on the following air pollutants as indicators of ambient air quality: ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM<sub>10</sub>), fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less (PM<sub>2.5</sub>), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health, and extensive health-effects criteria documentation is available for these pollutants, they are commonly referred to as “criteria air pollutants.” Health-based air quality standards have been established for these pollutants by ARB at the state level, and by the EPA at the national level. These standards, which include a margin of safety, were established to protect the public from adverse health impacts

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<sup>1</sup> Western Regional Climate Center (WRCC), 2009, *Period of Record Monthly Climate Summary for San Francisco Mission Dolores, California*. Available at: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7772>, Accessed: July 2009.

<sup>2</sup> Ibid.

resulting exposure to air pollution. California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. A brief description of each criteria air pollutant, including source types, health effects, and future trends, is provided below along with the most current monitoring station data and attainment designations for the project area. **Table IV.G-1: California and National Ambient Air Quality Standards**, p. IV.G-4, presents the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS).

### Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO<sub>x</sub> in the presence of sunlight. Reactive organic gases (ROG) are volatile organic compounds (VOCs) that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO<sub>x</sub> refers to a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels. A highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO<sub>x</sub> levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional scale, ozone is a regional pollutant.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the Earth from harmful ultraviolet radiation emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for ozone formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry.<sup>3</sup>

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<sup>3</sup> Godish, T., 2004, *Air Quality*, Lewis Publishers, New York, NY; pp. 51–55.

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**Table IV.G-1  
California and National Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards <sup>2,3</sup>	National Standards <sup>1</sup>	
			Primary <sup>3,4</sup>	Secondary <sup>3,5</sup>
Ozone	1-hour	0.09 ppm (180 µg/m <sup>3</sup> )	–	–
	8-hour	0.070 ppm (137 µg/m <sup>3</sup> )	0.075 ppm (147 µg/m <sup>3</sup> )	Same as Primary Standard
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )	–
	8-hour	9.0 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )	
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>6</sup>	Annual Arithmetic Mean	0.030 ppm (56 µg/m <sup>3</sup> )	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard
	1-hour	0.18 ppm (338 µg/m <sup>3</sup> )	0.100 ppm	–
Sulfur Dioxide (SO <sub>2</sub> )	Annual Arithmetic Mean	–	0.030 ppm (80 µg/m <sup>3</sup> )	–
	24-hour	0.04 ppm (105 µg/m <sup>3</sup> )	0.14 ppm (365 µg/m <sup>3</sup> )	–
	3-hour	–	–	0.5 ppm (1,300 µg/m <sup>3</sup> )
	1-hour	0.25 ppm (655 µg/m <sup>3</sup> )	–	–
Respirable Particulate Matter (PM <sub>10</sub> )	Annual Arithmetic Mean	20 µg/m <sup>3</sup>	–	Same as Primary Standard
	24-hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	
Fine Particulate Matter (PM <sub>2.5</sub> )	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>	Same as Primary Standard
	24-hour	–	35 µg/m <sup>3</sup>	
Lead <sup>7</sup>	30-day Average	1.5 µg/m <sup>3</sup>	–	–
	Calendar Quarter	–	1.5 µg/m <sup>3</sup>	Same as Primary Standard
Sulfates	24-hour	25 µg/m <sup>3</sup>	No National Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m <sup>3</sup> )		
Vinyl Chloride <sup>7</sup>	24-hour	0.01 ppm (26 µg/m <sup>3</sup> )		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.		

**Table IV.G-1 Continued**  
**California and National Ambient Air Quality Standards**

*Notes:*  $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter; ppm = parts per million;  $\text{mg}/\text{m}^3$  = milligrams per cubic meter

<sup>1</sup> National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The  $\text{PM}_{10}$  24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The  $\text{PM}_{2.5}$  24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency for further clarification and current federal policies.

<sup>2</sup> California standards for ozone, CO (except Lake Tahoe),  $\text{SO}_2$  (1- and 24-hour),  $\text{NO}_2$ , particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

<sup>3</sup> Concentration expressed first in units in which it was issued (i.e., parts per million [ppm] or micrograms per cubic meter [ $\mu\text{g}/\text{m}^3$ ]). Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius ( $^{\circ}\text{C}$ ) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of  $25^{\circ}\text{C}$  and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

<sup>4</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

<sup>5</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

<sup>6</sup> On February 19, 2008, the Office of Administrative Law approved a new  $\text{NO}_2$  ambient air quality standard that lowers the 1-hour standard to 0.18 ppm and establishes a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

<sup>7</sup> ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

*Source:* California Air Resources Board (ARB), 2008, *State and National Ambient Air Quality Standards*. Available at: <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>, Accessed: July 2009.

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 part per million (ppm) for 1 to 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing “tidal” volumes (the amount of air inhaled and exhaled), and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses such as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in permeability of respiratory epithelia; such increased permeability leads to an increased response of the respiratory system to challenges, and a decrease in the immune system’s ability to defend against infection.<sup>4</sup>

Emissions of ozone precursors VOC and  $\text{NO}_x$  have decreased over the past several years as a result of more stringent motor vehicle emissions standards and cleaner burning fuels. Consequently, peak 1-hour and 8-hour ozone concentrations in the SFBAAB have declined approximately 17 percent and 18 percent,

<sup>4</sup> Godish, T., 2004, *Air Quality*, Lewis Publishers, New York, NY, pp. 169–170.

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respectively in the past 20 years (1988 to 2007).<sup>5</sup> However, it is not clear if this reduction represents a significant change in the overall trend due to the variability caused by meteorological conditions in the SFBAAB.<sup>6</sup>

#### **Carbon Monoxide**

CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about 22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent causing the air pollution to become trapped near the ground beneath a layer of warm air.<sup>7</sup>

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases.<sup>8</sup>

As noted, in summer the inclusion of the cool marine layer partly builds up the inversion layer, while transporting CO and other pollutants out of the City. In contrast to problems caused by ozone, which tends to be a regional pollutant, CO problems tend to be localized.

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<sup>5</sup> California Air Resources Board (ARB), 2009, *ARB Almanac 2009 — Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants*, pp. 4-17–4-19.

<sup>6</sup> *Ibid.*, pp. 4-17 – 4-19.

<sup>7</sup> U.S. Environmental Protection Agency (EPA), 2009, *Six Common Air Pollutants*. Available at: <http://www.epa.gov/air/urbanair/>, Accessed: August 2009.

<sup>8</sup> *Ibid.*

### Particulate Matter

PM<sub>10</sub> consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation, and/or transformation of SO<sub>2</sub> and ROG.<sup>9</sup> PM<sub>2.5</sub> is a subgroup of PM<sub>10</sub>, consisting of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less.<sup>10</sup>

The adverse health effects associated with PM<sub>10</sub> depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAHs), and other toxic substances adsorbed onto fine particulate matter (referred to as the “piggybacking effect”), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM<sub>10</sub> may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death.<sup>11</sup> PM<sub>2.5</sub> poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Direct emissions of PM<sub>10</sub> remained relatively unchanged between 1975 and 2005 and are projected to remain unchanged through 2020. PM<sub>10</sub> emissions in the SFBAAB are dominated by emissions from area-wide sources, primarily fugitive dust sources. Available PM<sub>10</sub> data show some variation during the trend period, but overall there has been an upward trend in overall direct PM<sub>10</sub> emissions. However, the California and national maximum 24-hour concentrations annual average concentrations have decreased from 1988 to 2007. Although there continues to be variation in the number of state 24-hour standard exceedances, there has been a downward trend in the number of exceedances. The national 24-hour standard has not been exceeded in the SFBAAB since 1991.<sup>12</sup>

Annual average PM<sub>2.5</sub> concentrations in the SFBAAB have varied, but have shown a slight upward trend from 1999 to 2007. The 98<sup>th</sup> percentile of California and national 24-hour PM<sub>2.5</sub> concentrations have both

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<sup>9</sup> Ibid.

<sup>10</sup> California Air Resources Board (ARB), 2009, *ARB Almanac 2009 — Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants*, pp. 1-20.

<sup>11</sup> U.S. Environmental Protection Agency (EPA), 2009, *Six Common Air Pollutants*, op. cit.

<sup>12</sup> California Air Resources Board (ARB), 2009, *ARB Almanac 2009 — Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants*, pp. 4-24.

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declined during this period. Similar to PM<sub>10</sub>, year-to-year changes in meteorology can mask the impacts of emission control programs.<sup>13</sup>

### **Nitrogen Dioxide**

NO<sub>2</sub> is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO<sub>2</sub> are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO<sub>2</sub>.<sup>14</sup> The combined emissions of NO and NO<sub>2</sub> are referred to as NO<sub>x</sub> and reported as equivalent NO<sub>2</sub>. Because NO<sub>2</sub> is formed and depleted by reactions associated with ozone, the NO<sub>2</sub> concentration in a particular geographical area may not be representative of the local NO<sub>x</sub> emission sources.

Inhalation is the most common route of exposure to NO<sub>2</sub>. Because NO<sub>2</sub> has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty in breathing, vomiting, headache, and eye irritation during, or shortly after exposure. After a period of approximately four to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO<sub>2</sub> intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung function.<sup>15</sup>

### **Sulfur Dioxide**

SO<sub>2</sub> is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO<sub>2</sub> exposure pertain to the upper respiratory tract. SO<sub>2</sub> is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO<sub>2</sub> at 5 ppm or more. On contact with the moist mucous membranes, SO<sub>2</sub> produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO<sub>2</sub> concentrations may result in edema of the lungs or glottis and respiratory paralysis.

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<sup>13</sup> Ibid, pp. 4-25.

<sup>14</sup> U.S. Environmental Protection Agency (EPA), 2009, *Six Common Air Pollutants*, op. cit.

<sup>15</sup> Ibid.

## Lead

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

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995.<sup>16</sup>

As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95 percent between 1980 and 1999), and levels of lead in the air decreased by 94 percent between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13 percent of lead emissions. A National Health and Nutrition Examination Survey reported a 78 percent decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline.<sup>17</sup>

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story with regard to air quality management. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent ARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (the EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB identified lead as a TAC.

## Monitoring Station Data

Criteria air pollutants are monitored at several monitoring stations within the SFBAAB. The monitoring station nearest the project site is at 10 Arkansas Street in San Francisco, approximately 4 miles southwest of the project site. This monitoring station measures ozone, NO<sub>2</sub>, CO, SO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>. In general, the ambient air-quality measurements from this station are representative of the air quality in the vicinity

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<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

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of the project site. **Table IV.G-2: Summary of Annual Ambient Air Quality Data (2006–2008)**, p. IV.G-11, summarizes the air quality data from the most recent three years (2006–2008).

Table IV.G-2 lists the registered concentrations and exceedances of the CAAQS and NAAQS that occurred at this monitoring station from 2006 through 2008. During this period, the station did not register any days above the state 1-hour or 8-hour ozone standards. The state CO and NO<sub>2</sub> standards were also not exceeded in any of the last three years. The state 24-hour PM<sub>10</sub> standard was exceeded on multiple days in 2006 and 2007, but not once during 2008. The national 24-hour PM<sub>2.5</sub> standard was exceeded during 2006 and 2007, but not in 2008.

### **Attainment Status**

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to the CAAQS and NAAQS. Both ARB and the EPA use the type of monitoring data presented below (Table IV.G-2) to designate an area's attainment status with respect to the CAAQS and NAAQS, respectively, for criteria air pollutants. The purpose of these designations is to identify areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified." The "unclassified" designation is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. The most recent attainment designations with respect to the SFBAAB are shown in **Table IV.G-3: Attainment Status of the San Francisco Bay Area Air Basin with Respect to the California and National Ambient Air Quality Standards**, p. IV.G-12, for each criteria air pollutant. With respect to the CAAQS, the SFBAAB is currently designated as a nonattainment area for ozone, PM<sub>10</sub>, and PM<sub>2.5</sub> and as an attainment or unclassified area for all other pollutants (see Table IV.G-3). With respect to the NAAQS, the SFBAAB is designated as a marginal nonattainment area for ozone and as an attainment or unclassified area for all other pollutants (see Table IV.G-3).

**Table IV.G-2  
Summary of Annual Ambient Air Quality Data (2006-2008) <sup>1</sup>**

	2006	2007	2008
<b>OZONE</b>			
Maximum concentration (1-hour/8-hour, ppm)	0.053/0.046	0.060/0.053	0.082/0.066
Number of days state standard exceeded (1-hour/8-hour)	0/0	0/0	0/0
Number of days national standard exceeded (1-hour/8-hour) <sup>2</sup>	0.0/0	0.0/0	0.0/0
<b>CARBON MONOXIDE (CO)</b>			
Maximum concentration (1-hour/8-hour, ppm)	2.7/2.09	2.5/1.60	2.1/2.29
Number of days state standard exceeded (8-hour)	0	0	0
Number of days national standard exceeded (1-hour/8-hour)	0/0	0/0	0/0
<b>NITROGEN DIOXIDE (NO<sub>2</sub>)</b>			
Maximum concentration (1-hour, ppm)	0.107	0.069	0.062
Number of days state standard exceeded	0	0	0
Annual average (ppm)	0.016	0.016	0.016
<b>SULFUR DIOXIDE (SO<sub>2</sub>)</b>			
Maximum concentration (24-hour, ppm)	0.007	0.006	0.004
Number of days state standard exceeded	0	0	0
Number of days national standard exceeded	0	0	0
<b>FINE PARTICULATE MATTER (PM<sub>2.5</sub>)</b>			
Maximum concentration (µg/m <sup>3</sup> ) (National/California <sup>3</sup> )	54.3/54.3	45.2/45.2	29.4/39.2
Number of days national standard exceeded (measured/calculated <sup>4</sup> ) <sup>5</sup>	3/3.1	5/5.1	0/—
State annual average (µg/m <sup>3</sup> ) (National/California)	9.7/9.7	8.7/8.9	—/11.7
<b>RESPIRABLE PARTICULATE MATTER (PM<sub>10</sub>)</b>			
Maximum concentration (µg/m <sup>3</sup> ) (National/California <sup>3</sup> )	58.0/61.4	65.7/69.8	41.2/41.3
Number of days state standard exceeded (measured/calculated <sup>4</sup> )	3/17.3	2/12.0	0/0.0
Number of days national standard exceeded (measured/calculated <sup>4</sup> )	0/0.0	0/0.0	0/0.0
State annual average (µg/m <sup>3</sup> ) (National/California)	22.9	21.9	2.00

*Notes:* µg/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million; — = data not available

<sup>1</sup> Measurements were recorded at the Arkansas Street monitoring station.

<sup>2</sup> The 8-hour national ozone standard was revised to 0.075 ppm in March 2008. Statistics shown are based on the previous 0.08 ppm standard. The 1-hour national ozone standard was revoked on June 15, 2005. Statistics for the 1-hour national ozone standard are shown for informational purposes.

<sup>3</sup> State and national statistics may differ for the following reasons: State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State statistics are based on local conditions while national statistics are based on standard conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

<sup>4</sup> Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

<sup>5</sup> The national PM<sub>2.5</sub> 24-hour standard was revised from 65 µg/m<sup>3</sup> to 35µg/m<sup>3</sup> in 2006. Statistics shown are based on the 65 µg/m<sup>3</sup> standard.

*Sources:* California Air Resources Board (ARB), 2009, *Air Quality Data Statistics*, Available at: [www.arb.ca.gov/adam/welcome.html](http://www.arb.ca.gov/adam/welcome.html), Accessed: July 2009.

U.S. Environmental Protection Agency (EPA), 2009, *Monitor Value Report (NAAQS)*, Available at: [www.epa.gov/air/data/geosel.html](http://www.epa.gov/air/data/geosel.html), Accessed: July 2009.

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**Table IV.G-3  
 Attainment Status of the San Francisco Bay Area Air Basin with Respect to the California and  
 National Ambient Air Quality Standards**

<b>Pollutant</b>	<b>Averaging Time</b>	<b>California Attainment Status</b>	<b>National Attainment Status</b>
Ozone	1-hour	N	—
	8-hour	N	N
Carbon Monoxide (CO)	1-hour	A	U/A
	8-hour	A	U/A
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Arithmetic Mean	—	U/A
	1-hour	A	—
Sulfur Dioxide (SO <sub>2</sub> )	Annual Arithmetic Mean	—	—
	24-hour	A	A
	3-hour	—	—
	1-hour	A	—
Respirable Particulate Matter (PM <sub>10</sub> )	Annual Arithmetic Mean	N	—
	24-hour	N	U
Fine Particulate Matter (PM <sub>2.5</sub> )	Annual Arithmetic Mean	N	U/A
	24-hour	—	U/A
Lead	30-day Average	A	—
	Calendar Quarter	—	A

*Notes:*  
 N = nonattainment; A = attainment; U/A = unclassified/attainment; U = unclassified; — = no standard

*Sources:* California Air Resources Board (ARB), 2008, *Area Designation Maps/State and National*, Available at: [www.arb.ca.gov/desig/adm/adm.htm/](http://www.arb.ca.gov/desig/adm/adm.htm/), Accessed: June 2009.

U.S. Environmental Protection Agency (EPA), 2009, *Region 9: Air Programs, Air Quality Maps*, Available at: [http://www.epa.gov/region09/air/maps/maps\\_top.html](http://www.epa.gov/region09/air/maps/maps_top.html), Accessed: May 2009.

**Existing Emissions – San Francisco County**

**Table IV.G-4: Summary of 2008 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors (San Francisco County)**, p. IV.G-13, summarizes the emissions inventory for criteria air pollutants within San Francisco County for various source categories. According to San Francisco County’s emissions inventory, mobile sources are the largest contributor to the estimated annual average air pollutant levels of ROG, CO, NO<sub>x</sub>, and oxides of sulfur (SO<sub>x</sub>), accounting for approximately 54 percent, 96 percent, 94 percent, and 99 percent, respectively, of the total inventory. Area-wide sources (e.g., solvent evaporation, on-site fuel combustion for space and water heating, landscape maintenance equipment) account for approximately 68 percent and 38 percent of San Francisco County’s PM<sub>10</sub> and PM<sub>2.5</sub> emissions, respectively.

**Table IV.G-4  
 Summary of 2008 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors  
 (San Francisco County)**

Source Type/Category	Estimated Annual Average Emissions (Tons per Day)					
	ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Stationary Sources</b>						
Fuel Combustion	0.18	1.75	2.67	0.09	0.30	0.30
Waste Disposal	0.03	0.00	0.00	0.00	0.00	0.00
Cleaning and Surface Coating	3.99	0.00	0.00	–	–	–
Petroleum Production and Marketing	1.43	–	0.00		–	–
Industrial Processes	0.73	0.00	0.01	0.00	0.35	0.21
Subtotal (Stationary Sources)	6.35	1.75	2.69	0.09	0.65	0.51
<b>Area-wide Sources</b>						
Solvent Evaporation	8.30	–	–	–	–	–
Miscellaneous Processes	0.66	4.06	2.01	0.08	11.29	2.83
Subtotal (Area-wide Sources)	8.97	4.06	2.01	0.08	11.29	2.83
<b>Mobile Sources</b>						
On-Road Motor Vehicles	8.74	81.27	14.95	0.07	0.69	0.47
Other Mobile Sources	9.43	60.40	59.24	14.88	3.87	3.65
Subtotal (Mobile Sources)	18.17	141.67	74.19	14.95	4.56	4.12
<b>Total for San Francisco County</b>	<b>33.49</b>	<b>147.48</b>	<b>78.89</b>	<b>15.12</b>	<b>16.50</b>	<b>7.45</b>
<i>Notes:</i> ROG = reactive organic gases; CO = carbon monoxide; NO <sub>x</sub> = oxides of nitrogen; SO <sub>x</sub> = oxides of sulfur; PM <sub>10</sub> = respirable particulate matter; PM <sub>2.5</sub> = fine particulate matter Totals in table may not add exactly due to rounding.						

Source: California Air Resources Board (ARB). 2009. *Air Resources Board 2008 Emissions Inventory*. Available: <<http://www.arb.ca.gov/ei/maps/statemap/cntymap.htm>>. Accessed: August 9, 2008.

**Existing Emissions – Project Site**

The project site is currently occupied by the Fairmont Hotel complex, which includes the eight-story historic 1906 Fairmont Hotel building along Mason Street and a 23-story hotel tower above a five-story podium along Powell Street. **Table IV.G-5: Fairmont Hotel Complex Existing Emissions**, p. IV.G-14, summarizes 2009 operational emissions of the portion of the Fairmont Hotel complex that would be affected as a result of the proposed project (i.e., the existing 23-story hotel tower and five-story podium). Although the proposed project would also possibly reconfigure (i.e., combine and reduce) hotel rooms in the historic 1906 Fairmont Hotel building, as a conservative assumption, this action is not included in Table IV.G-5 because it is not anticipated to cause a net change in operational emissions. Currently, the historic 1906 Fairmont Hotel building is not operating at full capacity. In other words, the reduction in hotel rooms that would result from the proposed project is not expected to cause a reduction in vehicle trips generated by the hotel. Therefore, the proposed project was not credited with reducing operational

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vehicle trips as a result of hotel room reconfigurations. In addition, although rooms would be combined, the same amount of hotel room capacity would remain in operation, which would result in a comparable amount of area-source emissions (e.g., hot water use, consumer products) from the overall hotel.

**Table IV.G-5  
 Fairmont Hotel Complex Existing Emissions**

Emissions Source	Maximum Daily Emissions (lb/day) <sup>1</sup>					
	ROG	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Area Sources <sup>1</sup>	0.8	1.5	2.9	0.0	0.0	0.0
Mobile Sources <sup>1</sup>	6.0	7.4	54.8	0.0	7.2	1.4
Total Existing Emissions <sup>1</sup>	6.8	9.0	57.6	0.0	7.2	1.4

*Notes:*  
 lb/day = pounds per day; ROG = reactive organic gases; NO<sub>x</sub> = oxides of nitrogen; PM<sub>10</sub> = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PM<sub>2.5</sub> = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less (PM<sub>2.5</sub> is a subset of PM<sub>10</sub>).  
 Values may not add exactly due to rounding.  
<sup>1</sup> Emissions shown represent operation of the existing 23-story hotel tower and 5-story podium and not the historic 1906 Fairmont Hotel building. Emissions shown represent the maximum daily emissions that would occur during either summertime or wintertime conditions, whichever value is greater.  
 Detailed assumptions and modeling output files are available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.

*Source:* Data modeled by AECOM in 2009.

**Sensitive Receptors**

Sensitive land uses or sensitive receptors are facilities that generally accommodate people that may experience adverse effects from unhealthful concentrations of air pollutants. Commonly identified sensitive land uses are residences, hotels and motels, schools, pre-schools, playgrounds, childcare centers, retirement or convalescent homes, hospitals, and clinics.

The project site is surrounded by mid- to high-rise structures that consist of hotel, and institutional uses, as well as residential dwelling units. Hotel uses around the project site include the 10-story Stanford Court Hotel and the 19-20-story Mark Hopkins Hotel to the south of the project site. Although hotels are land uses where people stay temporarily, they are not considered sensitive receptors in the context of air quality because hotel guests do not typically live in hotels for an extended period of time. Institutional uses include the Pacific Union Club and Grace Cathedral to the west of the project site and the four-story University Club to the east of the site. The Pacific Union Club is located across Mason Street from the proposed project and Huntington Park is located directly west of the Pacific Union Club. Churches and other places of worship are also not considered sensitive receptors due to the relatively short periods of time people spend at these facilities. However, the Grace Cathedral School, a K–8 school operated at Grace Cathedral, is located across Taylor Street from Huntington Park, approximately 600 feet west of

the historic 1906 Fairmont Hotel building. The Grace Cathedral School and its playground areas are considered sensitive receptors. Residential apartment buildings, which are considered sensitive receptors, border the project site to the east, north, northwest, and southwest. Directly east of the project site are three residential apartment buildings ranging from three to nine stories. To the north along Sacramento Street, are apartment buildings, other residential buildings, and the historic 10-story Brocklebank apartment building at the corner of Mason and Sacramento Streets. A seven-story apartment building is also located southwest of the project site along California Street. Following buildout of the proposed project, the proposed on-site residents would also be considered sensitive receptors.

### **EXISTING AIR QUALITY – TOXIC AIR CONTAMINANTS**

Concentrations of TACs, or in federal terminology, hazardous air pollutants (HAPs), are also used as indicators of ambient air quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality*,<sup>18</sup> the majority of the estimated health risk from TACs is attributed to relatively few compounds, the most dominant being PM exhaust from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

Unlike the other TACs, no ambient monitoring data are available for diesel PM because a standardized method for measuring diesel PM has not been established. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses ARB's emissions inventory PM<sub>10</sub> database, ambient PM<sub>10</sub> monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and

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<sup>18</sup> California Air Resources Board (ARB), 2009, *ARB Almanac 2009 — Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants*, pp. 1-34.

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perchloroethylene.<sup>19</sup> It should be noted ARB has also designated asbestos and naturally-occurring asbestos as a TAC.

Diesel PM poses the greatest health risk among these 10 TACs. Based on receptor modeling techniques, ARB estimated the diesel PM health risk in the SFBAAB in 2000 to be 480 excess cancer cases per million people. The health risk associated with diesel PM decreased by 36 percent from 1990 to 2000. Overall, ambient levels of most TACs, except para-dichlorobenzene, have decreased since 1990.<sup>20</sup>

### **EXISTING AIR QUALITY – ODORS**

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to result in complaints than a familiar one. This is due to a phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

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<sup>19</sup> Ibid, pp. 1-34.

<sup>20</sup> Ibid, pp. 5-59–5-61.

The project site is adjacent to multi-family residential units and commercial land uses, both of which do not generate substantial odors. Industries and/or facilities that are likely to emit objectionable odors include wastewater treatment plants, landfills, composting facilities, petroleum refineries, and chemical and fiberglass manufacturers, among others. Potential sources of odors in the project vicinity include residential and commercial dumpsters. However, with proper disposal containers and regular trash collection services, odors from residential and commercial dumpsters would be minimized. In addition, all land uses are required to comply with the BAAQMD's Regulation 7 (Odorous Substances).

## **REGULATORY SETTING**

Air quality within the SFBAAB is addressed through the efforts of various federal, state, regional and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies primarily responsible for improving the air quality within the SFBAAB are discussed below.

## **CRITERIA AIR POLLUTANTS**

### **Federal Plans, Policies, Regulations, and Laws**

At the federal level, the EPA is charged with implementing national air quality programs. The EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress occurred in 1990.

The CAA required the EPA to establish primary and secondary NAAQS (Table IV.G-1). The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The EPA is responsible for reviewing all state SIPs to determine conformance to the mandates of the CAAA and to determine whether implementation will achieve air quality goals. If the EPA determines a SIP is inadequate, a Federal Implementation Plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in application of sanctions to transportation funding and stationary air pollution sources in the air basin.

### **State Plans, Policies, Regulations, and Laws**

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish the CAAQS (Table IV.G-1). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to the EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

ARB and local air pollution control districts are currently developing plans for meeting new national air quality standards for ozone and PM<sub>2.5</sub>. California's adopted 2007 State Strategy was submitted to the EPA as a revision to the SIP in November 2007.<sup>21</sup>

### **Regional and Local Plans, Policies, Regulations, and Laws**

The BAAQMD attains and maintains air quality conditions in San Francisco County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and the CCAA.

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<sup>21</sup> California Air Resources Board (ARB), 2008, *State Implementation Plan*, Available at: <http://www.arb.ca.gov/planning/sip/sip.htm>, Accessed: September 2009.

In addition, the adopted version of BAAQMD's *Guidelines Assessing the Air Quality Impacts of Projects and Plans* (BAAQMD *CEQA Guidelines*)<sup>22</sup> was released in December 1999. The BAAQMD's *CEQA Guidelines* is an advisory document that provides lead agencies, consultants, and project applicant(s) with uniform procedures for addressing air quality in environmental documents. The BAAQMD is currently in the process of updating its *CEQA Guidelines* and recommended significance thresholds. The new guidelines would involve developing quantitative CEQA significance thresholds for construction-related emissions of criteria pollutants, precursors, TACs, and greenhouse gases (GHGs).<sup>23</sup> The BAAQMD expects to adopt these new thresholds of significance in mid to late 2010.

### **Air Quality Plans**

The BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB, including ozone attainment plans (OAPs) for the national ozone standard and clean air plans (CAPs) for the California standard, in coordination with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). Past plans include the 2001 OAP and the 2000 CAP. The 2001 OAP is a revision to the SFBAAB part of the SIP and was prepared in response to the EPA's partial disapproval of the 1999 OAP. The 2001 OAP for the national 1-hour ozone standard included two commitments for further planning: (1) conduct a mid-course review of progress toward attaining the national 1-hour ozone standard by December 2003; and (2) provide a revised ozone attainment strategy to the EPA by April 2004.

The 2000 CAP was adopted by the BAAQMD on December 20, 2000 and was submitted to ARB. The CCAA requires the BAAQMD to update the CAP for attaining the state 1-hour ozone standard every three years. The 2000 CAP is the third triennial update of the BAAQMD's original 1991 CAP. The 2000 CAP includes a control strategy review to ensure that the CAP includes all feasible measures to reduce ozone, updates to the emissions inventory, estimates of emission reductions, and assessments of air quality trends.

In July 2003, the EPA proposed an interim final determination that the 2001 OAP corrected the deficiencies of the 1999 OAP and proposed approval of the 2001 OAP. Following three years of low ozone levels (2001, 2002, and 2003), the EPA in October 2003 proposed a finding that the SFBAAB had

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<sup>22</sup> Bay Area Air Quality Management District, 1999, *BAAQMD CEQA Guidelines*, December, Available at: <http://www.baaqmd.gov/pln/ceqa/index.htm>, Last updated December 1999, Accessed: July 2009.

<sup>23</sup> Bay Area Air Quality Management District (BAAQMD), 2009, *California Environmental Quality Act Draft Air Quality Guidelines*, December, Available at: [http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Draft%20BAAQMD%20CEQA%20Guidelines\\_Dec%207%202009.ashx](http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Draft%20BAAQMD%20CEQA%20Guidelines_Dec%207%202009.ashx). Accessed: September 2009, pp. 2-1-2-10.

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attained the national 1-hour standard and that certain elements of the 2001 OAP (attainment demonstration, contingency measures, and reasonable further progress) were no longer required. In April 2004, the EPA made final the finding that the SFBAAB had attained the 1-hour standard and approved the remaining applicable elements of the 2001 OAP: emission inventory, control measure commitments, motor vehicle emission budgets, reasonably available control measures, and commitments to further study measures. However, as part of a transition from the national 1-hour standard to an 8-hour standard, the 1-hour standard was revoked on June 15, 2005 and is no longer applicable.<sup>24</sup>

In April 2004, the EPA designated regions for the new national 8-hour standard, and these designations took effect on June 15, 2004. The EPA formally designated the SFBAAB as a non-attainment area for the national 8-hour ozone standard and classified the region as “marginal,” one of five classes of non-attainment areas for ozone ranging from “marginal” to “extreme.” Compliance with the standard is determined at each monitoring station using an average of the fourth-highest ozone reading for three years. A violation at any monitoring station results in a non-attainment designation for the entire region because ozone is a regional pollutant. Monitoring data for the San Martin station for the years 2006, 2007, and 2008 show an average of the fourth-highest ozone values of 76 parts per billion (one part per billion above the standard), hence the SFBAAB’s “marginal” non-attainment classification. Although certain elements of Phase 1 of the 8-hour implementation rule are still undergoing legal challenge, the EPA signed Phase 2 of the 8-hour implementation rule on November 9, 2005; however, it is not currently anticipated that marginal areas will be required to prepare attainment demonstrations for the 8-hour standard.<sup>25</sup>

Nonetheless, there is still a need for continued improvement to meet the state 1-hour ozone standard. The BAAQMD has begun a process to update, in cooperation with MTC and ABAG, the 2005 Bay Area Ozone Strategy (BAOS), which was previously adopted by the BAAQMD’s Board of Directors on January 4, 2006. The updated BAOS (i.e., 2009 Clean Air Plan) will describe current conditions, review the SFBAAB’s progress in reducing ozone levels to attain state 1-hour and 8-hour ozone standards, and describe how the SFBAAB’s proposed control strategy will fulfill the CCAA planning requirements for the state 1-hour ozone standard and mitigation requirements for transport of ozone and ozone precursors to neighboring air basins. The 2009 Clean Air Plan will also consider the impacts of ozone control measures on particulate matter, TACs, and GHGs in a single, integrated plan. The control strategies

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<sup>24</sup> Bay Area Air Quality Management District (BAAQMD), 2006, *Air Quality Plans*. Available at: <http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans.aspx>, Accessed: August 2009.

<sup>25</sup> Ibid.

include 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 programs in cooperation with MTC, local governments, transit agencies, and others.

Overall, the BAOS is a comprehensive document that describes the SFBAAB's strategy for compliance with state 1-hour ozone standard planning requirements and is a significant component of the region's commitment to achieving clean air to protect the public's health and the environment.<sup>26</sup>

### **BAAQMD Rules and Regulations**

The BAAQMD is responsible for limiting the amount of emissions that can be generated throughout the SFBAAB by stationary sources. Specific rules and regulations have been adopted that limit emissions that can be generated by various uses and/or activities and identify specific pollution reduction measures that must be implemented in association with various uses and activities. These rules regulate not only the emissions of the state and federal criteria pollutants, but also the emissions of TACs. The rules are also subject to ongoing refinement by the BAAQMD.

In general, all stationary sources with air emissions are subject to the BAAQMD's rules governing their operational emissions. Some emissions sources are further subject to regulation through the BAAQMD's permitting process. Through this permitting process, the BAAQMD also monitors the amount of stationary emissions being generated and uses this information in developing the CAP. The primary BAAQMD rules applicable to the project include the following:

- **Regulation 2, Rule 1:** General Permit Requirements
- **Regulation 6:** Particulate Matter and Visible Emissions;
- **Regulation 7:** Odorous Substances;
- **Regulation 8, Rule 3:** Architectural Coatings;
- **Regulation 8, Rule 15:** Emulsified Asphalt; and,
- **Regulation 11, Rule 2:** Asbestos, Demolition, Renovation and Manufacturing.

### **City and County of San Francisco's Construction Dust Control Ordinance**

The San Francisco Construction Dust Control Ordinance (Dust Control Ordinance) was adopted in July 2008, and requires that all site preparation work, demolition, and other construction activities within the

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<sup>26</sup> Bay Area Air Quality Management District (BAAQMD), 2006, *Bay Area 2005 Ozone Strategy*, Available at: <<http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Bay-Area-Ozone-Strategy.aspx>, Accessed: August 2009, p. 1.

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City and County of San Francisco comply with specific dust control measures. For projects over 0.5-acre, the Dust Control Ordinance requires that the project sponsor submit a Dust Control Plan for approval by the San Francisco Health Department prior to issuance of a building permit by the Department of Building Inspection (DBI).

The Dust Control Ordinance requires project sponsors and contractors responsible for construction activities to control construction dust on the site or implement other practices that result in equivalent dust control that are acceptable to the Director of Public Health. Dust suppression activities may include watering all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code.

Project sites that are over 0.5 acre and are located within 1,000 feet of sensitive receptors are required to develop a site-specific dust control plan to be approved by the director of the San Francisco Department of Public Health. The site-specific dust control plan for the proposed project shall require the project sponsor to:

- Submit a map to the Director of Public Health showing all sensitive receptors within 1,000 feet of the site;
- Wet down areas of soil at least three times per day;
- Provide an analysis of wind direction and install upwind and downwind particulate dust monitors;
- Record particulate monitoring results;
- Hire an independent, third party to conduct inspections and keep a record of those inspections;
- Establish shut-down conditions based on wind, soil migration, and other factors;
- Establish a hotline for surrounding community members who may be potentially affected by project-related dust;
- Limit the area subject to construction activities at any one time;
- Install dust curtains and windbreaks on the property lines, as necessary;
- Limit the amount of soil in hauling trucks to the size of the truck bed and secure with a tarpaulin;
- Enforce a 15 mile-per-hour (mph) speed limit for vehicles entering and exiting construction areas;
- Sweep affected streets with water sweepers at the end of the day;
- Install and utilize wheel washers to clean truck tires;
- Terminate construction activities when winds exceed 25 mph;
- Apply soil stabilizers to inactive areas; and,

- Sweep off adjacent streets to reduce particulate emissions.

Project sponsors are required to designate an individual to monitor compliance with dust control requirements.

## **TOXIC AIR CONTAMINANTS**

Air quality regulations also focus on TACs (in federal terminology HAPs). In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which ambient standards have been established (Table IV.G-1). Instead, the EPA and ARB regulate TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by BAAQMD establish the regulatory framework for TACs.

### **Federal Hazardous Air Pollutants**

Title III of the CAA requires the EPA to promulgate National Emissions Standards for Hazardous Air Pollutants (NESHAP) for certain categories of sources that emit one or more pollutants identified as HAPs/TACs. Emission standards may differ between “major sources” and “area sources” of TACs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (tpy) of any TAC or more than 25 tpy of any combination of TACs; all other sources are considered area sources. Promulgation of the emission standards has occurred in two phases. In the first phase (1992–2000), the EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the EPA is required to promulgate health risk–based emissions standards where such standards are deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA required the EPA to promulgate vehicle or fuel standards containing reasonable requirements to control TAC emissions, applying at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the CAA also required the use of reformulated gasolines in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions, including toxics.

### **State and Local Toxic Air Contaminant Programs**

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) (the Hot Spots Act). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review are necessary before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted the EPA's list of HAPs as TACs. Most recently, diesel PM was added to ARB's list of TACs.

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure for sources that emit that particular TAC. If there is a safe threshold at which there is no toxic effect from a substance, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emissions inventory and a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel-exhaust control measures and stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors and generators). In 2001, ARB adopted the Public Transit Bus Fleet Rule and Emissions Standards for New Urban Buses, which established emissions limits on 1985 and subsequent model year heavy-duty bus engines and vehicles for NO<sub>x</sub>, CO, non-methane hydrocarbons, PM, and formaldehyde. The emissions standards apply to all heavy-duty urban buses, including diesel-fueled buses. Therefore, the rule limits the emissions of two TACs identified by the ARB, diesel PM and formaldehyde. In 2007, a low-sulfur diesel fuel requirement and tighter emission standards for heavy-duty diesel trucks was put into effect to be followed in 2011 by the same standards being applied to off-road diesel equipment. Over time, the replacement of older vehicles will result in a fleet that produces substantially lower levels of TACs than currently. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, diesel PM) decreased significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low-Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, diesel PM concentrations are expected to be reduced by 75 percent in 2010 and 85 percent in 2020 from the estimated year-2000 level. As emissions are reduced, it is expected that risks associated with exposure to

the emissions will also be reduced. Emissions from heavy-duty diesel equipment associated with the project would be required to comply with the rules outlined above.

ARB recently published the *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land-use compatibility with TAC sources.<sup>27</sup> Although not a law or adopted policy, the handbook offers recommendations for the siting of sensitive receptors (such as proposed residential units) near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to help limit the exposure of children and other sensitive populations to TACs. ARB received a number of comments on the handbook from air districts, other agencies, real estate representatives, and others. The comments included concern regarding whether ARB was playing a role in local land-use planning and whether it is valid to rely on static air quality conditions during the next several decades in light of technological improvements, and support for providing information that can be used in local decision making. ARB may modify the handbook in the future in response to these comments. The handbook is used to assess how much exposure would occur as a result of project implementation. A discussion of the land uses in proximity of the project site is provided above in Sensitive Receptors.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under BAAQMD Rule 2-1 (General Permit Requirements), Rule 2-2 (New Source Review), and Rule 2-5 (New Source Review of Toxic Air Contaminants), all sources that have the potential to emit TACs are required to obtain permits from the BAAQMD. Permits may be granted if the sources are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The BAAQMD limits emissions and public exposure to TACs through a number of programs and prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

The BAAQMD analyzes sources that require a permit (e.g., performs health risk assessments) based on their potential to emit TACs. If it is determined that the project's emissions would exceed the BAAQMD's threshold of significance for TACs, as identified below, the source has to implement the best available control technology for TACs (T-BACT) to reduce emissions. BAAQMD's T-BACT measures apply to sources such as petroleum and semiconductor industrial facilities, organic liquid storage tanks, solvent cleaning operations, and waste processing facilities among others. Residential, retail, commercial

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<sup>27</sup> California Air Resources Board (ARB), 2005, *Air Quality and Land Use Handbook: A Community Health Perspective*.

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uses such as those of the proposed project typically do not require T-BACT measures because the nominal amounts of TACs generated by these uses. If a source cannot reduce the risk below the threshold of significance even after implementing T-BACT, the BAAQMD will deny the permit. This helps to prevent new problem emissions sources and reduces emissions from existing sources by requiring them to apply new technology when retrofitting. The BAAQMD's air quality permitting process applies to stationary sources; properties that are exposed to elevated levels of TACs from non-stationary sources, and the non-stationary sources themselves (e.g., on-road vehicles), are not subject to air quality permits. Further, for reasons of feasibility and practicality, mobile sources (e.g., cars, trucks, etc.) are not required to implement T-BACT even if they have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on mobile sources are subject to regulations implemented at the federal and state levels by the EPA and ARB, respectively.

#### **City of San Francisco Health Code Article 38 Consistency Analysis**

The City of San Francisco's Health Code was amended in October 2008 with Article 38 to require certain urban infill residential developments to install a ventilation system that is certified (by a licensed professional) to remove more than 80 percent of ambient PM<sub>2.5</sub> emissions from habitable areas of the dwelling units. Urban infill developments are subject to the ventilation system requirements of Article 38 if the proposed project would:

- Be located within the Potential Roadway Exposure Zone (as established by San Francisco Department of Public Health)<sup>28</sup>;
- Construct a building with 10 or more residential units; and,
- Be in a location where PM<sub>2.5</sub> concentrations from local roadway traffic at the building's edge are greater than 0.2 µg/m<sup>3</sup>.

The first two criteria can be determined using information provided by the San Francisco Department of Public Health and the project sponsor. For the third criterion, Article 38 requires that a project perform an Air Quality Assessment that evaluates the PM<sub>2.5</sub> concentrations associated with local roadway traffic sources at the project site. Following completion of an Air Quality Assessment, an Air Quality Report that summarizes the preparers' professional expertise, the methodologies used to determine PM<sub>2.5</sub> concentrations at the project site, and results of the Air Quality Assessment should be submitted to the director of the San Francisco Department of Public Health for approval. The following presents an Article 38 consistency analysis for the proposed project.

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<sup>28</sup> Potential Roadway Exposure Zones are defined as areas within the City and County of San Francisco that may exhibit high ambient PM<sub>2.5</sub> concentrations due to their proximity to freeways and major roadways (i.e., "Local Roadway Traffic Sources").

The proposed project is located in a “Potential Roadway Exposure Zone” and would include 160 residential units. Accordingly, the PM<sub>2.5</sub> concentration levels associated with local roadway traffic sources in proximity of the proposed project were evaluated using the EPA-approved CAL3QHCR model. CAL3QHCR estimates pollutant concentration levels based on user-provided meteorological data, traffic volumes, and emissions rates. For this analysis, meteorological data were provided by BAAQMD from the Mission Bay meteorological station in San Francisco, which was determined to be representative of meteorological conditions at the project site. Traffic volumes were obtained from the SF CHAMP traffic model, which is maintained by the San Francisco County Transportation Authority and PM<sub>2.5</sub> emission factors were obtained from ARB’s motor vehicle emissions factor model, EMFAC2007.<sup>29</sup>

The air quality assessment, conducted by the San Francisco Department of Public Health, determined that maximum PM<sub>2.5</sub> concentrations associated with local roadway traffic at the project site would be 0.15 µg/m<sup>3</sup>.<sup>30</sup> Because this level is less than the screening criteria of 0.2 µg/m<sup>3</sup>, the proposed project would not be required to install air filtration systems, and the proposed project has complied with Article 38 of the San Francisco Health Code.

## **ODORS**

### **Federal**

Odors are typically considered a local air quality problem. The EPA has not established regulations that deal with the generation of odors. However, local air districts have developed rules that apply to and regulate the generation of odors. As shown below in the BAAQMD Rules and Regulations, the air district enforces rules that pertain to odors.

### **State**

As discussion above, odors are considered to be a local problem. The regulatory framework for odors is discussed further below in the Local Regulations Setting.

### **Local**

Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable stress among the public and often generating citizen complaints to local governments and the

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<sup>29</sup> California Air Resources Board (ARB), 2009, *EMFAC2007 Release*, Available at: [http://www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm), Accessed: August 2009.

<sup>30</sup> San Francisco City and County Department of Public Health Environmental Health Section, 2009, Letter to Lu Blazej stating that the project site would be below the action threshold. April 23. This letter is available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.

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BAAQMD. The BAAQMD's Regulation 7 (Odorous Substances) places general limitations on odorous substances and specific emission limitations on certain odorous compounds in the SFBAAB. This regulation does not apply until the Air Pollution Control Officer (APCO) receives ten or more odor complaints within a 90-day period alleging that a person or entity has caused odors at, or beyond, the source's property line, which are perceived to be objectionable by the complainants in the normal course of their work, travel, or residence. When this regulation becomes effective as a result of complaints, the limits specified in the regulation remain effective until such time as no complaints have been received by the APCO for 1 year. The limits specified by this regulation become applicable again if the APCO receives odor complaints from five or more complainants within a 90-day period.

## **IMPACTS**

### **SIGNIFICANCE THRESHOLDS**

#### **CEQA Guidelines Appendix G**

The thresholds used to determine the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State *CEQA Guidelines* and guidance from BAAQMD, which have been adopted and modified by the San Francisco Planning Department. In accordance with the criteria listed in Appendix G, the proposed project would be determined to result in a significant impact related to air quality if it would result in any of the following:

- G.a Conflict with, or obstruct implementation of, the applicable air quality plan;
- G.b Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- G.c Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- G.d Expose sensitive receptors to substantial pollutant concentrations; or
- G.e Create objectionable odors affecting a substantial number of people.

#### **Adopted Bay Area Air Quality Management District Thresholds of Significance for Criteria Air Pollutants and Toxic Air Contaminants**

As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. Pursuant to the

adopted BAAQMD *CEQA Guidelines* (1999),<sup>31</sup> the proposed project would result in a significant air quality impact if:

- BAAQMD-recommended control measures are not incorporated into project design or implemented during project construction;
- Long-term operational (regional) emissions of ROG, NO<sub>x</sub>, or PM<sub>10</sub> exceed the BAAQMD-recommended mass emissions threshold of 80 pounds per day (lb/day);
- Long-term operational (local) mobile-source emissions of CO violate or contribute substantially to a violation of the NAAQS or CAAQS;
- Sensitive receptors are exposed to a substantial incremental increase in TAC emissions (e.g., stationary or mobile-source) that exceed 10 chances per million for excess cancer risk and/or a hazard index of 1 for non-cancer risk at the Maximally Exposed Individual (MEI); or
- Sensitive receptors would be located near an existing odor source where one confirmed complaint per year averaged over a 3-year period, or three unconfirmed complaints per year averaged over a 3-year period, have been experienced by existing receptors as close as the project to the odor source; or by existing receptors in the vicinity of a similar facility considering distance, frequency, and odor control, where there is currently no nearby development and for proposed odor sources near existing receptors.

## ANALYSIS METHODOLOGY

### Criteria Air Pollutant and Precursor Emissions

Emissions of short-term, construction-related and long-term, operation-related (i.e., regional and local) criteria air pollutants and precursors were assessed in accordance with BAAQMD-recommended methodologies.

Project-generated, construction-related emissions of criteria air pollutants and precursors were assessed in accordance with BAAQMD-recommended methods. The adopted BAAQMD *CEQA Guidelines* do not suggest quantification of construction emissions. However, the project's construction emissions were quantified for the purposes of full disclosure of the magnitude of emissions. Where quantification was required, criteria air pollutants and precursor emissions were modeled using the URBEMIS 2007 Version 9.2.4 computer model.<sup>32</sup>

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<sup>31</sup> Bay Area Air Quality Management District, 1999, *BAAQMD CEQA Guidelines*, December, Available at: <http://www.baaqmd.gov/pln/ceqa/index.htm>, Last updated December 1999, Accessed: July 2009, pp. 9–25.

<sup>32</sup> Rimpo and Associates, 2008, *URBEMIS2007 for Windows, Version 9.2.4*. Available at: [www.urbemis.com](http://www.urbemis.com), Accessed: August 2009.

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Project-generated, operational (i.e., regional) emissions of criteria air pollutants and precursors (e.g., mobile- and area-sources) were quantified using the URBEMIS 2007 Version 9.2.4 computer model.<sup>33</sup> Modeling was based on project-specific data (e.g., size and type of proposed uses) and vehicle trip information from the traffic study prepared for this project.<sup>34</sup> Modeled project-generated, long-term operational emissions were compared with the adopted BAAQMD thresholds of significance.

### **Toxic Air Contaminant Emissions**

At this time, BAAQMD has not adopted a methodology for analyzing short-term, construction-related emissions of TACs and does not recommend the completion of health risk assessments (HRAs) for such emissions, with a few exceptions (e.g., where construction phase is the only phase of project and construction activities would occur for a period of 9 years or more). Therefore, under the adopted BAAQMD thresholds, construction-related emissions of TACs were assessed in a qualitative manner. Operational TACs were also discussed qualitatively based on the projected net change in TAC-generating activities (e.g., vehicle trips and delivery truck activity).

## **IMPACT EVALUATION**

### **Impact AQ-1 The proposed project would implement all required construction control measures and therefore would not result in any significant construction-related air quality impacts. (Less than Significant with Mitigation) [Criteria G.a and G.b]**

Construction of the proposed project would include demolition of the existing hotel tower and podium, excavation for the proposed parking garage, possible reconfiguration of hotel rooms in the historic 1906 Fairmont Hotel building, and construction of a new podium, mid-rise residential component, and residential tower. Construction activities are anticipated to last approximately 36 months. For the purpose of this analysis, construction was assumed to start in January 2012, which is the earliest possible date that construction activities could commence.

During construction of the proposed project, criteria air pollutant emissions would be temporarily and intermittently generated from a variety of sources over a 36-month period. Project-related demolition, excavation, and site grading activities would generate fugitive PM dust emissions. Fugitive PM dust emissions are primarily associated with ground disturbance and material transport and vary as a function of parameters, such as soil silt content and moisture, wind speed, acreage of disturbance area, and the

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<sup>33</sup> Ibid.

<sup>34</sup> LCW Consulting, 2009, *950 Mason Street Transportation Study*, December 24. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E, pp. 24–26, 29.

intensity of activity performed with construction equipment. Exhaust emissions from diesel equipment, material transport trips, and construction worker-commute trips also contribute to short-term increases in PM emissions, but to a lesser extent. Exhaust emissions from these construction-related mobile sources would also include ROG and NO<sub>x</sub>. In addition, the application of architectural coatings (i.e., interior and exterior surface painting) would result in off-gas emissions of ROG.

According to BAAQMD, PM<sub>10</sub> is the pollutant of greatest concern with respect to construction-related emissions. Although heavy-duty equipment, material transport, and employee commutes result in emissions of criteria air pollutants (e.g., CO) and ozone precursors (e.g., ROG and NO<sub>x</sub>), these emissions are included in the regional emissions inventory, which serves as the basis for the air quality plans, and are not expected to impede attainment of the ozone standard or maintenance of the CO standard in the SFBAAB.<sup>35</sup> Consequently, the BAAQMD has not currently adopted mass emission thresholds for construction-related emissions of ROG, NO<sub>x</sub>, or CO, and bases its determination of significance on implementation of fugitive PM<sub>10</sub> dust control measures.<sup>36</sup> The BAAQMD's approach to CEQA analyses of construction-related fugitive PM<sub>10</sub> dust emissions is to require implementation of effective and comprehensive control measures rather than a detailed quantification of construction emissions. However, for the purposes of full disclosure, the project's construction-related criteria air pollutant and precursor emissions have been quantified using URBEMIS2007 and are presented in **Table IV.G-6: Summary of Maximum Daily Construction Emissions by Phase**, p. IV.G-32. The BAAQMD requires that all feasible control measures, which are dependent on the size of the construction area, nature of the activities involved, and proximity to sensitive receptors, shall be implemented during project construction. According to the adopted BAAQMD *CEQA Guidelines*, implementation of all feasible construction dust control measures would reduce construction emissions to less-than-significant levels. Because the applicable construction control measures (i.e., Basic and Optional Control Measures from adopted BAAQMD *CEQA Guidelines*, listed below) recommended by the BAAQMD are already required by the City and County of San Francisco as part of the Dust Control Ordinance, the project's construction-related emissions of fugitive PM<sub>10</sub> dust would be considered less than significant. Pursuant to the Dust Control Ordinance, the project site, approximately 2.6 acres, requires a dust control plan that describes all dust control measures to be implemented during demolition and construction activities, which is proposed as part of the Construction Management Plan for the proposed project. The dust control measures that would be implemented during construction are listed above in Regional and Local Plans, Policies,

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<sup>35</sup> Bay Area Air Quality Management District, 1999, *BAAQMD CEQA Guidelines*, op. cit., p. 13.

<sup>36</sup> *Ibid*, pp. 13–15.

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Regulations, and Laws, pp. IV.G-21 to IV.G-23. During demolition of the existing hotel tower and podium, construction activities must also comply with all requirements of Regulation 11, Rule 2 (Asbestos Demolition, Renovation and Manufacturing) to avoid exposing nearby sensitive receptors to asbestos, which is discussed further in Impact AQ-4. As a result, construction emissions associated with the proposed project would not violate or contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations.

**Table IV.G-6  
 Summary of Maximum Daily Construction Emissions by Phase**

Construction Year – Phase	Pollutant Emissions (lb/day)			
	ROG	NO <sub>x</sub>	PM <sub>10</sub> <sup>1</sup>	PM <sub>2.5</sub> <sup>4</sup>
<b>Year 1 (2012)</b>				
Demolition	1.4	11.9	0.7	0.6
Excavation/Site Grading	3.7	32.0	1.5	1.4
Maximum Daily Emissions in 2012 <sup>2</sup>	3.7	32.0	1.5	1.4
<b>Year 2 (2013)</b>				
Excavation/Site Grading	3.5	29.6	1.4	1.3
Building Construction	4.5	24.4	1.3	1.2
Ramp Demolition	1.1	8.0	0.5	0.5
Maximum Daily Emissions in 2013 <sup>3</sup>	4.5	29.6	1.4	1.3
<b>Year 3 (2014)</b>				
Building Construction	4.1	22.3	1.2	1.1
Interior/Exterior Finishing	43.8	2.4	0.1	0.1
Maximum Daily Emissions in 2014 <sup>4</sup>	49.0	24.7	1.3	1.2
<b>Maximum Daily Emissions for Total Construction Period</b>	<b>49.0</b>	<b>32.0</b>	<b>1.5</b>	<b>1.4</b>
BAAQMD Proposed New Significance Thresholds (lb/day) (Average Daily Emissions)	54	54	82	54
<i>Notes:</i> lb/day = pounds per day; ROG = reactive organic gases; NO <sub>x</sub> = oxides of nitrogen; PM <sub>10</sub> = particulate matter with aerodynamic diameter less than 10 microns; PM <sub>2.5</sub> = particulate matter with aerodynamic diameter less than 2.5 microns. <sup>1</sup> The proposed new BAAQMD construction-related thresholds for PM <sub>10</sub> and PM <sub>2.5</sub> only apply to exhaust emissions. Therefore, PM <sub>10</sub> and PM <sub>2.5</sub> emissions shown are only those associated with construction-related exhaust (e.g., construction worker vehicles, material delivery trucks, and heavy-duty construction equipment). <sup>2</sup> Maximum daily emissions during 2012 would occur during excavation/grading activities. <sup>3</sup> Maximum daily emissions of ROG during 2013 would occur during building construction. Maximum daily emissions of NO <sub>x</sub> , PM <sub>10</sub> , and PM <sub>2.5</sub> during 2013 would occur during excavation/site grading activities. <sup>4</sup> Maximum daily emissions during 2014 would occur during the potential overlap of build construction and interior/exterior finishing activities. Detailed assumptions and modeling output files available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.				

Sources: Bay Area Air Quality Management District (BAAQMD), 1999, *BAAQMD CEQA Guidelines*, December. Data modeled by AECOM in 2009.

According to the adopted BAAQMD *CEQA Guidelines*, compliance with the BAAQMD's Basic and Optional Control Measures would reduce the project's construction-related air quality impacts to less-than-significant levels. As described above, due to the project being located in the City, it is also subject to the *Dust Control Ordinance*. The project's Construction Management Plan incorporates all dust control measures from the BAAQMD's Basic and Optional Control Measures and the *Dust Control Ordinance*. Although the project's Construction Management Plan would include the BAAQMD's Basic and Optional Control Measures, because the measures are not required by law and in order to ensure that the measures are legally binding through CEQA, the BAAQMD Basic and Optional Control measures have been included as mitigation measures for this project. Thus, in accordance with the BAAQMD's requirements, the project would implement **Mitigation Measure M-AQ-1** below, and all requirements of the *Dust Control Ordinance*, which is also included as part of the project per the sponsor's Construction Management Plan to minimize fugitive dust emissions during construction activities. Therefore, construction emissions associated with the proposed project would not violate or contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. The impact associated with the project's construction emissions would thus be less than significant by compliance with the City's Dust Control Ordinance, detailed in Mitigation Measure M-AQ-1.

**M-AQ-1: Implement BAAQMD Basic and Optional Control Measures During Construction**

The following mitigation measures shall be implemented during construction activities to avoid short-term significant impacts to air quality:

**BAAQMD Basic Control Measures**

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizer on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep street daily (with water sweepers) if visible soil material is carried into adjacent public streets.

**Optional Control Measures**

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.

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- Install wind breaks, or plant trees/vegetative wind breaks at windward sides of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 miles per hour.
- Limit the area subject to excavation, grading, and other construction activities at any one time.

#### **Additional Construction Mitigation Measures**

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measures (ATCM) Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

#### **Impact AQ-2 The gross and net increase in operational emissions associated with the proposed project would not exceed the adopted BAAQMD operational thresholds of significance. (Less than Significant) [Criteria G.a and G.b]**

This analysis quantified the operational emissions associated with the existing eastern portion of the Fairmont Hotel (i.e., hotel tower and podium), and the operational emissions associated with the proposed uses. As discussed above, the proposed project could also reconfigure hotel rooms in the historic 1906 Fairmont Hotel building; however, as also discussed above in Existing Emissions – Project Site, p. IV.G-13, these actions are not anticipated to cause a net change in operational emissions associated with the historic 1906 Fairmont Hotel building. The net change in operational emissions associated with implementation of the proposed project is compared to the adopted BAAMQD applicable quantitative thresholds of significance.

The existing and proposed project's regional area- and mobile-source emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> were estimated using URBEMIS2007 Version 9.2.4 computer program,<sup>37</sup> which is designed to model emissions for land use development projects.<sup>38</sup> URBEMIS allows land use selections that include project location and trip generation rates. URBEMIS accounts for area-source emissions from the usage of natural gas, wood stoves, fireplaces, landscape maintenance equipment, and consumer products; and mobile-source emissions associated with vehicle trips. Regional area-source emissions for the existing Fairmont Hotel and the proposed project were estimated based on the proposed land uses type and size identified in Chapter III, Project Description. Regional mobile-source emissions for the existing and proposed project were estimated based on trip generation rates provided in the traffic study prepared for the project, and default settings and parameters contained in URBEMIS 2007 for San Francisco County.<sup>39</sup>

The proposed project would also require daily delivery/service trucks that would serve the proposed residents. Delivery/service truck emissions were estimated using a separate URBEMIS2007 run that only utilized the operational module (i.e., mobile sources). The vehicle fleet was adjusted for delivery/service trucks to reflect all medium heavy-duty trucks. It should be noted that delivery/service trucks could range from small moving vans to heavy, heavy-duty trucks. The medium heavy-duty truck vehicle class was used as a conservative estimate of all delivery/service truck emissions. The daily trip generation rate for delivery/service trucks was provided in the traffic study for the proposed project.

**Table IV.G-7: Summary of Existing, Proposed, and Net Change in Operational Emissions** below, presents the maximum daily operational emissions associated with the existing portion of the Fairmont Hotel complex that would be affected by the proposed project, the proposed project emissions, and the net change in operational emissions associated with implementation of the proposed project. The existing operational emissions associated with the Fairmont Hotel complex were modeled using year 2012, which is the last possible year that it would operate as it currently exists based on the assumption that construction would commence in 2012.<sup>40</sup> The 2012 emissions are used as the existing operational emissions to calculate the net change in operational emissions associated with the proposed project.

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<sup>37</sup> Rimpo and Associates, 2008, op. cit.

<sup>38</sup> The current BAAQMD *CEQA Guidelines* establish operational thresholds of significance for ROG, NO<sub>x</sub>, and PM<sub>10</sub>. BAAQMD has not developed a mass emissions threshold of significance for CO and SO<sub>2</sub> due to both pollutants being sufficiently controlled by air quality plans and regulations. Therefore, CO and SO<sub>2</sub> emissions are not shown in Table IV.G-7. CO and SO<sub>2</sub> emissions were quantified using URBEMIS and are available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.

<sup>39</sup> LCW Consulting, 2009, op. cit., pp. 24–26, 29.

<sup>40</sup> The 1906 portion of the historic Fairmont Hotel would remain in operation during construction of the proposed project.

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It should be noted that the existing emissions shown in Table IV.G-5 are for year 2009, which is the year the Notice of Preparation (NOP) for this EIR was completed and represents the existing baseline conditions on the project site for CEQA purposes. However, for the purposes of this analysis, year 2012 was used to avoid underestimating the net increase in operational emissions. Year 2012 vehicle emission factors are less than those in 2009 because of turnover in the vehicle fleet and improved emissions technologies. Therefore, using year 2009 for existing operational emissions would generate larger existing emissions, which would result in a smaller net increase in emissions associated with implementation of the proposed project.

**Table IV.G-7  
 Summary of Existing, Proposed, and Net Change in Operational Emissions**

Source	Pollutant Emissions (lb/day)			
	ROG	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Proposed Project <sup>1</sup></b>				
Area Sources	31.7	3.2	13.1	12.6
Mobile Sources	4.3	5.8	8.7	1.6
Delivery Trucks	0.1	0.7	0.2	0.0
<b>Gross Proposed Project Operational Emissions</b>	<b>36.0</b>	<b>9.7</b>	<b>21.9</b>	<b>14.3</b>
<b>Existing Emissions <sup>2</sup></b>				
Area Sources	0.8	1.5	0.0	0.0
Mobile Source	4.7	5.8	7.2	1.4
<b>Gross Existing Project Operational Emissions</b>	<b>5.5</b>	<b>7.3</b>	<b>7.2</b>	<b>1.4</b>
<b>Net Change in Operational Emissions</b>	<b>30.5</b>	<b>2.4</b>	<b>14.8</b>	<b>12.9</b>
BAAQMD Operational Significance Thresholds	80	80	80	no current threshold
Proposed New BAAQMD Operational Significance Thresholds	54	54	82	54
<i>Notes:</i> lb/day = pounds per day; ROG = reactive organic gases; NO <sub>x</sub> = oxides of nitrogen; PM <sub>10</sub> = particulate matter with aerodynamic diameter less than 10 microns; PM <sub>2.5</sub> = particulate matter with aerodynamic diameter less than 2.5 microns; – = no threshold. <sup>1</sup> The proposed project's operational emissions were modeled in URBEMIS 2007 for year 2014, the earliest expected year of operation. <sup>2</sup> The existing project's operational emissions were modeled in URBEMIS for year 2012, the last year in which the existing project would operate Detailed assumptions and modeling output files are available at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.				

*Sources:* Bay Area Air Quality Management District (BAAQMD), 1999, *BAAQMD CEQA Guidelines*, December; Data modeled by AECOM in 2009.

As shown in Table IV.G-7, the net change or gross operational emissions associated with implementation of the proposed project would not exceed adopted BAAQMD thresholds of significance for ROG, NO<sub>x</sub>, and PM<sub>10</sub>. In addition, the gross emissions associated with operation of the proposed project would not exceed the adopted thresholds of significance. As a result, the proposed project would not violate or contribute substantially to an existing air quality violation or conflict with air quality planning in the SFBAAB. The impact associated with the project's operational emissions would thus be less than significant.

It should be noted that Table IV.G-7 also presents the proposed new BAAQMD operational thresholds of significance for informational purposes only. The proposed thresholds have not been adopted by BAAQMD and are not used in this analysis to make a significance determination. The proposed BAAQMD thresholds of significance are discussed in further detail in the Proposed BAAQMD Draft Air Quality Guidelines section, p.IV.G-47.

**Impact AQ-3 The proposed project would not cause or contribute a substantial amount of vehicle trips to local intersections that would result in an exceedance of the 1-hour or 8-hour CO CAAQS. (Less than Significant) [Criterion G.d]**

CO concentration is a direct function of motor vehicle activity, particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land uses, such as residential areas, schools, preschools, playgrounds, and hospitals. As a result, BAAQMD recommends analysis of CO emissions at a local, rather than a regional, level. Because increased CO concentrations are usually associated with roadways that are congested and with heavy traffic volume, BAAQMD has established preliminary screening criteria to determine with fair certainty that, if not violated, project-generated, long-term operational local mobile-source emissions of CO would not result in, or substantially contribute to, emissions concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm, respectively. The BAAQMD *CEQA Guidelines* suggest that projects that would not violate any of the following preliminary screening criteria would not be anticipated to result in or substantially contribute to an exceedance of CO CAAQS. This determination is made if the project:

- Would not generate motor vehicle CO emissions that exceed 550 lb/day;
- Would not increase the delay time or degrade the level of service<sup>41</sup> (LOS) at intersections or roadway links previously operating at LOS D, E, or F;

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<sup>41</sup> Level of service (LOS) is a qualitative measure of traffic operating conditions based on a letter grade, LOS A being the best and LOS F being the worst. These LOS grades are based on factors such as vehicle delay, speed,

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- Would not cause the LOS of an intersection to decline to D, E, or F; or
- Would not increase traffic volumes on nearby roadways by 10 percent or more unless the increase in project traffic volume is less than 100 vehicles per hour.

The net (i.e., 82 lb/day) and gross (i.e., 126 lb/day) level of operational CO emissions associated with the proposed project would not exceed 550 lb/day.<sup>42</sup> As determined in the traffic study, the proposed project would not affect any intersection that currently operates at LOS D or below.<sup>43</sup> However, the LOS at the intersection of California and Mason Streets would degrade from LOS C, under existing conditions, to LOS D under cumulative plus project conditions (year 2030). Although the LOS would worsen to LOS D during cumulative-plus-project conditions, the proposed project would contribute approximately 0.5 percent of the intersection's total PM peak-hour traffic volume, and account for approximately 5 percent of the net change in PM peak-hour traffic volumes from existing to cumulative conditions. Therefore, the proposed project's contribution to the California and Mason Street intersection's LOS degradation would not be substantial and the project itself would not cause the LOS to decline to LOS D.

Furthermore, the University of California, Davis (UCD) CO Protocol considers only intersections operating at LOS E or F to have the potential to result in a violation of the CAAQS and NAAQS for CO.<sup>44</sup> As shown in Table IV.G-2, the highest ambient CO 8-hour concentration registered in the past 3 years (i.e., 2.29 ppm in 2008) is approximately 25 percent of the CAAQS. Due to stricter vehicle emissions standards in newer cars, new technology, and increased fuel economy, future CO emission factors under cumulative conditions (year 2030) would be substantially lower than those under existing conditions. Therefore, CO emissions from traffic generated by the proposed project would not be anticipated to substantially contribute to emissions that exceed the 1-hour CAAQS of 20 ppm or the 8-hour CAAQS of 9.0 ppm, respectively. As a result, this impact would be less than significant.

**Impact AQ-4 The proposed project would not expose sensitive receptors to substantial concentrations of toxic air contaminants during construction or operation of the proposed project. (Less than Significant) [Criterion G.d]**

The exposure of sensitive receptors to TAC emissions from on-site sources during construction and operation of the proposed project are discussed separately below. The adopted BAAQMD threshold for TAC emissions is described in the Significance Thresholds subsection, pp. IV.G-28 to IV.G-29 above.

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and congestion at the intersection or roadway segment. In general, LOS A represents free-flow conditions with no congestion and LOS F represents sever congestion and delay under stop-and-go conditions.

<sup>42</sup> Detailed assumptions and modeling output files are available at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.

<sup>43</sup> LCW Consulting, 2009, op. cit., pp. 32, 48.

<sup>44</sup> UCD ITS, 1997, *Transportation Project-level Carbon Monoxide Protocol*, December, pp. 4-7.

### Short-Term Construction-Related Emissions

Construction-related activities of the proposed project would result in temporary diesel PM exhaust emissions from off-road, heavy-duty diesel equipment for demolition of the existing on-site structures, soil excavation, site grading, and building construction. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts.<sup>45</sup> At this time, BAAQMD has not adopted a methodology for analyzing health risks from construction-generated diesel PM exhaust.

In January 2001, the EPA promulgated a Final Rule to make emission standards more stringent for model year 2007 heavy-duty diesel engines and all subsequent model years. These emission standards represent a 90 percent reduction in NO<sub>x</sub> emissions, 72 percent reduction in non-methane hydrocarbon emissions, and 90 percent reduction in PM emissions in comparison to the 2004 model year emission standards. In December 2004, ARB adopted a fourth phase of emission standards (Tier IV) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by the EPA on May 11, 2004.<sup>46</sup> As such, engine manufacturers are required to meet treatment-based exhaust standards for NO<sub>x</sub> and PM starting in 2011 that are more than 90 percent lower than current levels. This would put emission factors from off-road engines (e.g., construction, agricultural, and mining equipment) virtually on par with those from on-road, heavy-duty diesel engines.

The dose<sup>47</sup> to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the MEI. Thus, the risks estimated for an MEI are higher if a fixed exposure occurs over a longer period of time. According to the State Office of Environmental Health Hazard Assessment, a health risk assessment, which determines the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period. However, such assessments should be limited to the period/duration of activities (e.g.,

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<sup>45</sup> California Air Resources Board (ARB), 2003, *HARP User Guide*. Available at: <http://www.arb.ca.gov/toxics/harp/harpug.htm>, Last updated July 29, 2008, Appendix K pp. 1–2.

<sup>46</sup> In May 2004, EPA finalized a national program to reduce emissions from future nonroad engines. As part of the rule, new nonroad engines (e.g., construction, agriculture, mining) are required to be equipped with similar advanced emissions-control technology as highway trucks and buses. The rule will also reduce the sulfur content in diesel fuel to 15 ppm in 2010, which will allow engine manufacturers to use advanced clean technologies similar to catalytic technologies used in passenger vehicles.

<sup>47</sup> Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance.

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construction or operations) associated with the proposed project.<sup>48</sup> In December 2009, the BAAQMD published *Draft Air Quality Guidelines*.<sup>49</sup> Additional information pertaining to these guidelines are found on p. IV.G-47. As stated in the BAAQMD *Draft Air Quality Guidelines*, “current models and methodologies for conducting health risk assessment are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities resulting in difficulties in producing accurate estimates of health risk.”<sup>50</sup> The proposed project’s construction activities would occur for approximately 3 years, which is one-third of the minimum exposure period for health risk assessments. In addition, the use of heavy-duty, diesel-fueled construction equipment would occur intermittently throughout the construction period. It should also be noted that **Mitigation Measure M-AQ-1**, p. IV.G-33 would include measures that reduce diesel PM exhaust emissions during construction (e.g., limiting idling time, properly tuned equipment).

Thus, because the use of off-road, heavy-duty diesel equipment would be temporary (i.e., approximately 36 months), in combination with the highly dispersive properties of diesel PM<sup>51</sup> and further reductions in exhaust emissions from ARB and the EPA’s rules for diesel off-road engines, project-generated, construction-related TAC emissions would not expose sensitive receptors to substantial emissions of TACs. Although it is acknowledged that for carcinogenic TACs such as diesel PM, any exposure could present some level of risk, the incremental increase in exposure associated with the proposed project’s construction activities would not be considered a substantial amount of TACs for the reasons discussed above. As a result, this impact would be less than significant.

In addition, as discussed in Section IV.P, Hazards and Hazardous Materials, naturally-occurring asbestos in the bedrock during excavation of the additional parking levels could be encountered and the historic 1906 Fairmont Hotel was determined to contain asbestos containing material (ACM). As discussed above, naturally-occurring asbestos and asbestos are designated as TACs by ARB. While it is not known whether naturally-occurring asbestos is present in the bedrock located under the project site, the project sponsor would implement **Mitigation Measure M-HZ-4a**, p. IV.P-17, and **Mitigation Measure M-HZ-4b**, p.

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<sup>48</sup> Salinas, Julio, Staff toxicologist, Office of Environmental Health Hazard Assessment, Sacramento, CA. August 3, 2004—telephone conversation with Kurt Legleiter of EDAW regarding exposure period for determining health risk.

<sup>49</sup> Bay Area Air Quality Management District (BAAQMD), 2009 (December), *Final Draft California Environmental Quality Act Draft Air Quality Guidelines*.

<sup>50</sup> Bay Area Air Quality Management District (BAAQMD), 2009, *Final Draft California Environmental Quality Act Draft Air Quality Guidelines*, op. cit., pp. 8-9.

<sup>51</sup> Zhu, Y. W. C. Hinds, S. Kim, and C. Sioutas, 2002, Concentration and Size Distribution of Ultrafine Particles near a Major Highway. *Journal of the Air and Waste Management Association* 52:1032–1042.

IV.P-18, and **Mitigation Measure M-HZ-4c**, p. IV.P-18, which would reduce this impact to a less-than-significant level. In addition, the project would be required to comply with Title 17, California Code of Regulations, Section 93105 to control naturally-occurring asbestos from construction, grading, and other operations and enforced by the BAAQMD. It is possible that room reconfiguration as well as demolition of the existing hotel tower and the podium could expose nearby receptors to asbestos. The project would be required to comply with all the requirements of BAAQMD's Regulation 11, Rule 2 (Asbestos Demolition, Renovation and Manufacturing) and Section 19827.5 of the California Health and Safety Code. The control measures required by these regulations would ensure that ACMs are properly demolished, contained, and disposed. Compliance with state and local regulations would reduce any asbestos-related impacts to a less-than-significant level. In addition, the proposed project would also implement **Improvement Measure I-HZ-5**, p. IV.P-21, which calls for the development of an Asbestos Operation and Maintenance Plan for construction activities (see Section IV.P, Hazards and Hazardous Materials for more detailed information). The Asbestos Operation and Maintenance Plan is proposed as part of the project per the sponsor's Construction Management Plan and would be prepared prior to commencing construction activities. This improvement measure would further reduce the less-than-significant impacts with respect to asbestos.

### **Long-Term Operational-Related Emissions**

The project sponsor would replace the existing hotel tower and podium with a new podium, mid-rise residential component, and residential tower. Residential and hotel uses do not typically generate large amounts of TAC emissions because these uses do not involve industrial or manufacturing processes that are usually associated with large TAC emissions. The residential component could include diesel-fueled back-up generators, which could be long-term sources of TACs. However, as further discussed below, all back-up generators installed as part of the proposed project would replace existing sources and not result in a net increase in TAC emissions. As shown above in Table IV.G-7, implementation of the proposed project would cause a net increase in mobile-source emissions. It is expected that the increase in vehicle trips would include trips by diesel-fueled delivery/service trucks to and from the project site. The nearest sensitive receptors to the proposed residential loading area on Sacramento Street, besides residents of the proposed project, would be residents in the Brocklebank Apartments approximately 70 feet away across Sacramento Street.

The traffic study for the proposed project provided a separate trip generation rate for daily delivery/service trucks that would visit the proposed project. Delivery/service trucks are expected to range from small moving vans to trucks 53 feet in length or larger. As a conservative assumption, all

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delivery/service trucks were modeled as medium heavy-duty trucks in URBEMIS2007, 82 percent of which are assumed to be diesel-fueled for San Francisco County in 2014, the year by which the project is expected to be operational and receiving deliveries. As shown in Table IV.G-7, the daily PM<sub>10</sub> emissions associated with project-related delivery/service trucks would be approximately 0.2 lb/day. It should be noted that not all of these emissions would be diesel PM. In addition, the net change in mobile-source PM<sub>10</sub> emissions was estimated to be approximately 2 lb/day for the proposed project (without delivery/service trucks). Even if all of the net increase in mobile-source PM emissions was diesel PM, the emissions would be emitted over the course of a day and throughout the project area and not exclusively on the project site or at any other single location. In addition, as part of ARB's Diesel Risk Reduction Program to reduce diesel PM exhaust emissions, future diesel PM exhaust emissions are expected to decrease through more stringent standards applicable to all new diesel-fueled engines, aggressive reductions from in-use diesel engines (e.g., retrofits, in-use compliance programs), and use of low-sulfur fuel that would provide the quality of diesel fuel needed to utilize advanced diesel PM exhaust control technology.<sup>52</sup> Given the project's relatively small and widely distributed net increase in diesel PM emissions, coupled with the highly dispersive properties of diesel PM, and anticipated future reductions in diesel PM exhaust emissions, it is not anticipated that TAC emissions associated with the proposed project would result in an incremental increase in cancer risk that exceeds 10 in one million.

The historic 1906 Fairmont Hotel includes a dry cleaning facility that would continue to operate with implementation of the proposed project. Dry cleaning facilities could result in TAC emissions from perchloroethylene, which is used as a dry cleaning agent. All facilities, including the existing dry cleaning facility that would use perchloroethylene are required to comply with the requirements of the Dry Cleaning ATCM, which established requirements for record keeping, operations, and maintenance of equipment that use perchloroethylene to avoid exposing nearby receptors and/or contaminating groundwater. It should be noted that the ARB has also approved amendments to the Dry Cleaning ATCM that will phase-out the use of perchloroethylene dry cleaning machines and equipment by 2023, which would apply to the existing dry cleaning facility. The proposed podium, mid-rise residential component, and residential tower would not develop an additional dry cleaning facility as part of the proposed project. Therefore, implementation of the proposed project would not result in a net increase in TAC emissions (i.e., perchloroethylene) associated with dry cleaning facilities above existing conditions.

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<sup>52</sup> California Air Resources Board (ARB), 2005, *Air Quality and Land Use Handbook: A Community Health Perspective*, p. 55.

Furthermore, in order to ensure that the energy requirements of the proposed podium, mid-rise residential component, and residential tower are met throughout blackouts and brownouts, the proposed project would also include emergency generators. Operation of emergency generators would result in diesel PM emissions that could affect nearby and the proposed project's residential receptors. However, the proposed project would not result in a net increase in generators operating on site. In addition, all back-up generators would only be operated periodically for maintenance and testing purposes and thus would not generate a constant or large source of TAC emissions. Therefore, the proposed project would cause a slight net increase of TAC emissions associated with mobile sources, but would not cause a net increase of TAC emissions associated with area and stationary sources. Considering the information above regarding proposed project's mobile-, area-, and stationary-source TAC emissions this impact would be less than significant.

**Impact AQ-5 Construction and operation of the proposed project would not expose a substantial number of people to objectionable odors. (Less than Significant) [Criterion G.e]**

Construction of the proposed project is not anticipated to expose nearby on- and off-site receptors to objectionable odors. During construction of the proposed project, exhaust odors from diesel engines and emissions associated with the application of architectural coatings may be considered offensive to some individuals. However, because odors would be intermittent and temporary (i.e., over approximately 36 months) and would disperse rapidly with distance from the source, construction-generated odors would not result in the exposure of a substantial number of receptors to objectionable odorous emissions. Furthermore, the project's compliance with Regulation 8 Rule 3<sup>53</sup> (Architectural Coatings) and Rule 15<sup>54</sup> (Emulsified Asphalt) would ensure that odors generated by short-term project construction would not affect a substantial number of people.

The proposed project would replace a hotel tower, podium structure, and associated support uses with residential units and new hotel support uses. Residential uses and hotels are not typically associated with the generation of substantial odorous emissions. Although project-specific hotel, restaurant, and retail uses have the potential to generate sources of odors from garbage or food waste, these sources are not

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<sup>53</sup> Bay Area Air Quality Management District (BAAQMD), 2009, *Regulation 8 Organic Compounds, Rule 3, Architectural Coatings*, Available at: <http://baaqmd.gov/~media/Files/Planning%20and%20Research/Rules%20and%20Regs/reg%2008/rg0803.ashx>, Accessed September 2009.

<sup>54</sup> Bay Area Air Quality Management District (BAAMQD), 1994, *Regulation 8 Organic Compounds, Rule 15 Emulsified and Liquid Asphalts*, Available at: <http://baaqmd.gov/~media/Files/Planning%20and%20Research/Rules%20and%20Regs/reg%2008/rg0815.ashx>, Accessed September 2009.

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expected to be different in type or intensity from existing sources, which currently exist and would be anticipated to be minor in the context of the project's dense urban setting. Land uses that are typically associated with large odor sources include dry cleaning establishments, restaurants, and gasoline stations. Fast food restaurants have the potential to generate odors from the operation of charbroilers and deep fat fryers. However, while there is a potential for odors to occur, the project's compliance with industry standard waste disposal methods and BAAQMD Regulation 7 (Odorous Substances) would limit potential odor exposure. In addition, it is anticipated that any waste product from on-site operations with the potential to emit odors (e.g., trash enclosures) would be disposed in proper containers and/or handled in a manner that would not emit any objectionable odors. The historic 1906 Fairmont Hotel includes a dry cleaning facility that would continue to operate with implementation of the proposed project and therefore odors associated with the existing dry cleaning facility are part of the existing odor conditions. As discussed in Impact AQ-4, the proposed project would not development additional dry cleaning facilities that would result in a net increase of odors associated with dry cleaning operations. The existing dry cleaning operations are also subject to BAAQMD Regulation 7. Therefore, the proposed project would not expose a substantial number of people to objectionable odors. As a result, the impact would be less than significant.

### **CUMULATIVE IMPACTS**

**Impact AQ-CU-6 The proposed project's short-term construction emissions and long-term operational emissions would not contribute to cumulatively considerable criteria air pollutant or precursor emissions in the region. (Less than Significant) [Criterion G.c]**

Implementation of the proposed project would result in short-term construction emissions and long-term operational emissions. The BAAQMD considers projects that would generate criteria air pollutant and precursor emissions exceeding the BAAQMD-recommended project-level thresholds of significance to also be cumulatively considerable. The cumulative impacts associated with construction and operational activities are discussed separately below.

### **Construction-Generated Emissions of Criteria Air Pollutants and Precursors**

Under the adopted BAAQMD *CEQA Guidelines*, construction emissions associated with the proposed project would be considered less than significant because the required construction-related control measures are included as **Mitigation Measure M-AQ-1** and in the Construction Management Plan, which is proposed as part of the project. Construction emissions are short-term and temporary in nature. Following buildout of the proposed project, all construction emissions associated with the proposed

project would cease. The proposed project would implement all necessary control measures from the adopted BAAQMD *CEQA Guidelines* as well as the *Dust Control Ordinance* to reduce construction emissions. Therefore, construction emissions associated with the proposed project would not result in a cumulatively considerable impact to air quality.

### **Operational Emissions of Criteria Air Pollutants and Precursors**

Project operations would cause a permanent net increase in criteria air pollutant and precursor emissions. The adopted BAAQMD *CEQA Guidelines* considers a project to result in a cumulatively considerable impact if operational criteria air pollutant and precursor emissions would exceed the project-level emissions thresholds of significance (i.e., 80 lbs/day of ROG, NO<sub>x</sub>, or PM<sub>10</sub>); the general plan would not be consistent with the applicable air quality plan; or the proposed project would not be consistent with the existing land use designation (i.e., the project would require a general plan amendment).

As shown in Table IV.G-7 above, the proposed project's gross and net increase of criteria air pollutant and precursor emissions would be less than the adopted BAAQMD operational emissions thresholds of significance, which means the first cumulative criterion would not be exceeded. The Air Quality Element of the *San Francisco General Plan* is focused on implementing land use and transportation planning to increase the use of public transportation and reduce single-occupancy vehicle trips, and promotes the use of alternative means of transportation (e.g., walking, biking). The first section of the Air Quality Element focuses on how the *General Plan* can help achieve adherence to air quality standards. Therefore, the *General Plan* is considered to be consistent with the goals of the applicable CAP to attain and maintain healthful air quality, which means the second cumulative criterion would not be exceeded.

Lastly, the proposed project would be consistent with the land use designation (Residential Mixed-High Density District [RM-4]) specified for the project site by the *San Francisco General Plan*. Therefore, the intensity of the proposed use (i.e., high-density residential) for the project site is accounted for in the CAP for the SFBAAB. Although the proposed project would cause a net increase in mobile- and area-source emissions, these emissions have been taken into consideration while developing the air quality plan for the region to meet attainment. As a result, emissions of criteria air pollutants and precursors associated with operation of the proposed project would not hinder the SFBAAB's ability or efforts to attain and maintain healthy air quality. Therefore, the proposed project would not cause a cumulatively considerable impact with respect to operational emissions.

### **Cumulative Construction-Related Exposure of TACs to Sensitive Receptors**

As discussed in Impact AQ-4, construction activities associated with the proposed project would be temporary and would cease following completion of the proposed project. In addition, the length of the total construction period (i.e., 36 months) is approximately 1/3 of the minimum exposure period (i.e., 9 years) recommended for health risk assessments. Therefore, construction-related TAC emissions would not cause an incremental increase of TAC emissions in the region for a significant period of time that would cumulatively affect nearby sensitive receptors. In addition, mitigation measures contained in **Mitigation Measures M-AQ-1** would help reduce diesel PM exhaust emissions associated with construction activities. For these reasons, coupled with the highly dispersive nature of diesel PM, construction-related TAC emissions would not cause a cumulatively considerable significant impact to nearby sensitive receptors.

Furthermore, potential naturally-occurring asbestos encountered in the bedrock of the project site during excavation would be sufficiently controlled through implementation of **Mitigation Measure H-HZ-4a** (p. IV.P-17), **Mitigation Measure H-H-4b** (p. IV.P-18), and **Mitigation Measure H-HZ-4c** (p. IV.P-18). The proposed project would be required to comply with Title 17, California Code of Regulations, Section 93105 to control naturally-occurring asbestos from construction, grading, and other operations. In addition, the proposed project would be required to comply with BAAQMD Regulation 11, Rule 2 during demolition and construction activities and would implement **Improvement Measure I-HZ-5** (p. IV.P-21) to minimize potential exposure of asbestos from the demolition of the existing structures. Therefore, with compliance with all state and regional requirements, and implementation of project mitigation and improvements measures the proposed project would not cause a cumulatively considerable significant impact associated with asbestos and naturally-occurring asbestos emissions during construction.

### **Cumulative Operational TAC Emissions**

As discussed under Impact AQ-4, the proposed project would cause a slight increase of diesel PM emissions associated with delivery/service trucks. Although these emissions would be long-term TAC emissions, mobile-source TAC emissions would occur throughout the region and would not contribute a cumulatively considerable amount of TAC emissions at the project site that would be anticipated to cause an incremental increase in cancer risk above one in a million. In addition, the proposed project would not cause a net increase in TAC emissions associated with dry cleaning facilities (i.e., perchloroethylene) and emergency generators (i.e., diesel PM) operating at the project site. Therefore, the project's long-term operational activities would not generate a cumulatively considerable net increase of TAC emissions. Thus, this impact would be less than significant.

## **BAAQMD DRAFT AIR QUALITY GUIDELINES AND PROPOSED THRESHOLDS**

### **BAY AREA AIR QUALITY MANAGEMENT DISTRICT'S PROPOSED NEW THRESHOLDS OF SIGNIFICANCE FOR CRITERIA AIR POLLUTANTS AND TOXIC AIR CONTAMINANTS**

BAAQMD is currently in the process of updating its *CEQA Guidelines* and is proposing new thresholds of significance. According to a report by BAAQMD, its draft guidelines will include quantitative thresholds of significance for evaluating construction-related and operational emissions of criteria pollutants and precursors, TACs, and GHGs (see Section IV.H, Greenhouse Gas Emissions of this EIR for a discussion of proposed thresholds for GHGs).<sup>55</sup> Differences between the adopted and proposed new thresholds include lower thresholds for emissions of operational ozone precursors (ROG and NO<sub>x</sub>) and PM<sub>2.5</sub>. BAAQMD expects to adopt these proposed new thresholds of significance in mid to late 2010.

These proposed thresholds are still under review and have not been formally adopted by BAAQMD's Board of Directors. Thus, they are presented for information purposes. However, in anticipation of the BAAQMD adopting new thresholds of significance, the BAAQMD's proposed thresholds of significance will be discussed with respect to each air quality impact where the proposed significance thresholds or guidance is anticipated to change. At the time of writing this Draft EIR (and at the time the NOP of this EIR was released for the proposed project), the adopted BAAQMD *CEQA Guidelines'* thresholds of significance<sup>56</sup> were still the applicable and effective thresholds. Therefore, all significance conclusions in this analysis of air quality impacts are based on the adopted BAAQMD *CEQA Guidelines*. However, if the proposed thresholds of significance are adopted by BAAQMD's Board of Directors, the proposed project would likely result in a significance air quality impact if:

- Average daily construction emissions would exceed 54 lb/day of ROG, NO<sub>x</sub>, or PM<sub>2.5</sub>, or 82 lb/day of PM<sub>10</sub>. The threshold for PM<sub>10</sub> and PM<sub>2.5</sub> only apply to exhaust emissions;
- Applicable BAAQMD-recommended Basic Construction Mitigation Measures are not implemented during construction activities;
- Operational emissions would exceed 54 lb/day or 10 tpy of ROG, NO<sub>x</sub>, or PM<sub>2.5</sub>, or 82 lb/day or 15 tpy of PM<sub>10</sub>;
- The proposed residents would be exposed to, or if the project's construction or operation would cause an excess cancer risk level exceeding 10 in one million or a Hazard Index greater than 1.0 at the MEI; or

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<sup>55</sup> Bay Area Air Quality Management District (BAAQMD), 2009 (December), *Final Draft California Environmental Quality Act Draft Air Quality Guidelines*, op. cit., pp. 2-1 – 2-10.

<sup>56</sup> Bay Area Air Quality Management District, 1999, *BAAQMD CEQA Guidelines*, op. cit.

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- The project's construction or operational activities would generate annual PM<sub>2.5</sub> concentrations that exceed 0.3 µg/m<sup>3</sup>.
- For cumulative risks and hazards, the BAAQMD is proposing the following thresholds.
  - An excess cancer risk level of more than 100 in one million or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 from all local sources within 1,000 foot zone of influence; or
  - An concentration greater than 0.8 micrograms per cubic meter (µg/m<sup>3</sup>) annual average PM<sub>2.5</sub> from all local sources within 1,000 foot zone of influence.

As the BAAQMD thresholds are only proposed, the proposed thresholds of significance could be subject to change prior to final adoption by BAAQMD's Board of Directors.

### PROPOSED BAAQMD GUIDELINES IMPACT EVALUATION

As discussed above, the current BAAQMD *CEQA Guidelines* are the applicable guidelines at the time of this analysis and have been used to make the significance determinations for the proposed project. The following analyses are provided for informational purposes and in anticipation of BAAQMD's adoption of their *Draft Air Quality Guidelines*. The CEQA Checklist criterion or criteria that would be addressed by each analysis below is also provided for informational purposes.

#### **Construction Impact Analysis [Criteria G.a and G.b]**

In anticipation of BAAQMD's future adoption of quantitative thresholds of significance for construction-related emissions and for full disclosure of the magnitude of construction emissions, this analysis provides a quantitative analysis of the project's construction emissions to determine whether they would exceed the proposed new thresholds. Construction-related emissions of criteria air pollutants and precursors were modeled in accordance with BAAQMD-recommended methodologies using project specifications (e.g., volume to be demolished, duration, soil export volume) described in Chapter III, Project Description, and default settings and parameters contained in URBEMIS2007 for San Francisco County. Table IV.G-6 above, summarizes the maximum daily emissions of criteria air pollutant (i.e., PM<sub>10</sub> and PM<sub>2.5</sub>) and precursor (i.e., ROG and NO<sub>x</sub>) emissions that would be generated during each phase of the three year construction period. It should be noted that the BAAQMD's *Draft Air Quality Guidelines* propose an average daily emissions threshold, while the emissions shown in Table IV.G-6 represent the maximum daily emissions that could occur during each year of construction. As shown, the maximum daily construction emissions for ROG, NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> would not exceed any of the recently proposed BAAQMD thresholds of significance.

While Table IV.G-6 shows estimates for emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> that would be generated during construction of the proposed project, it is also important to note that nominal levels of SO<sub>2</sub> and CO would also be emitted during these activities. The quantities of SO<sub>2</sub> generated during construction activities would be minimal because construction equipment would use ultra-low sulfur diesel fuel (15 ppm). In 1998, the SFBAAB was redesignated as attainment for the CO NAAQS and is currently designed as attainment for the CAAQS. Due to newer emissions technology and vehicle fleet turnover, CO is not considered a pollutant of regional concern; rather, BAAQMD focuses on localized concentrations of CO. In addition, construction-related CO emissions are considered to be accounted for in the emissions inventory for regional air quality plans and are not anticipated to impede attainment or maintenance of the CO standard.<sup>57</sup> For these reasons and the fact that control of SO<sub>2</sub> and CO emissions from construction activities is not required to achieve attainment, no significance thresholds for CO or SO<sub>2</sub> emissions from construction activities have been proposed in the BAAQMD's *Draft Air Quality Guidelines* and therefore emissions of CO and SO<sub>2</sub> are not shown in Table IV.G-6.<sup>58</sup>

As shown in Table IV.G-6 above, the maximum daily construction-related emissions would not exceed any of the BAAQMD's proposed new thresholds of significance for construction-generated emissions. Therefore, even if the proposed new BAAQMD construction thresholds of significance are adopted, the project's construction-related emissions would still be considered less than significant. However, as the BAAQMD thresholds have not yet been adopted and the *Air Quality Guidelines* are still in draft form, the methodologies used to quantify emissions are also subject to revision. Should the proposed BAAQMD thresholds be adopted under the methodologies used to quantify emissions, **Mitigation Measure M-AQ-Potential Construction Mitigation Under BAAQMD Draft Air Quality Guidelines and Proposed Thresholds** would be required and would require the proposed project's construction contractors to use the best available construction equipment (Tier IV), further reducing construction-related impacts from criteria air pollutants and precursors.

In addition, the BAAQMD's *Draft Air Quality Guidelines* recommends that all projects implement a list of Basic Construction Mitigation Measures during construction activities whether or not construction-related emissions exceed the proposed thresholds of significance. In anticipation of BAAQMD's future

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<sup>57</sup> Bay Area Air Quality Management District (BAAQMD), 1999, *BAAQMD Guidelines [for] Assessing the Air Quality Impacts of Project and Plans*, p. 13.

<sup>58</sup> Bay Area Air Quality Management District (BAAQMD), 2009 (October), *Revised Draft Options and Justification Report [for] California Environmental Quality Act Thresholds of Significance*, Available at: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Revised%20Draft%20CEQA%20Thresholds%20%20Justification%20Report%20Oct%202009.ashx>, p. 2.

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adoption of the *Draft Air Quality Guidelines*, additional Construction Mitigation Measures are proposed for the proposed project that would meet the currently proposed BAAQMD-recommended Basic Construction Mitigation Measures. It should be noted that the BAAQMD's currently required dust control measures (i.e., Basic and Optional Control Measures) and proposed Basic Construction Mitigation Measures are included in the project's Construction Management Plan as part of the proposed project, and as part of **Mitigation Measure M-AQ-1**, pp. IV.G-33 to IV.G-34.

**Operational Impact Analysis [Criteria G.a and G.b]**

In anticipation of the future adoption of the proposed new BAAQMD quantitative thresholds of significance for operation, the proposed new BAAQMD operational thresholds of significance are also listed in Table IV.G-7 above. The proposed new BAAQMD thresholds of significance are lower for ROG and NO<sub>x</sub> and slightly higher for PM<sub>10</sub>. The proposed new BAAQMD thresholds of significance also include a new threshold for PM<sub>2.5</sub>. As shown in Table IV.G-7, neither the net change nor the gross operational emissions associated with the proposed project would exceed the proposed new BAAQMD operational thresholds of significance. Therefore, even if the proposed new BAAQMD operational thresholds of significance are adopted, the operational emissions impact associated with the proposed project would be less than significant.

**Localized CO Impact Analysis [Criterion G.d]**

BAAQMD has developed a refined localized CO concentration-screening threshold for signalized intersections based on the peak-hour vehicle volume in its *Draft Air Quality Guidelines*. It should be noted that the threshold of significance would remain the same as the current BAAQMD *CEQA Guidelines*; however, BAAQMD has proposed a different screening criteria as part of its *Draft Air Quality Guidelines*. Even under PM peak-hour cumulative-plus-project conditions, the California and Mason Streets intersection would carry approximately 6 percent (1,334 vehicles per hour) of the BAAQMD-recommended screening level of 24,000 vehicles per hour.<sup>59</sup> Therefore, it is anticipated that project-generated traffic congestion at the intersection would not result in a violation of the CO CAAQS. Even if the proposed BAAQMD *Draft Air Quality Guidelines* are adopted, this impact would remain less than significant.

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<sup>59</sup> Bay Area Air Quality Management District (BAAQMD), 2009 (December), *Final Draft California Environmental Quality Act Draft Air Quality Guidelines*, op. cit., pp. 3-4.

### **Construction-Related TAC and PM<sub>2.5</sub> Impact Analysis [Criterion G.d]**

The BAAQMD's *Draft Air Quality Guidelines* recommend that projects quantitatively evaluate the TAC and PM<sub>2.5</sub> emissions associated with construction activities. The primary construction-related TAC of concern is diesel PM from heavy-duty construction equipment operating on-site. If construction activities would result in an increase in cancer risk above 10 in one million or an increased non-cancer hazard index greater than 1.0, then the project's construction-related TAC emissions would be considered significant. In addition, if construction-related exhaust emissions would cause an incremental increase of annual PM<sub>2.5</sub> concentrations greater than 0.3 µg/m<sup>3</sup>, then the project's construction-related PM<sub>2.5</sub> emissions would also be considered significant.

It should be noted that the *Draft Air Quality Guidelines* acknowledge that construction-related TAC emission are temporary in nature. In addition, diesel PM emissions are typically reduced by 70 percent at approximately 500 feet from the source.<sup>60</sup> Furthermore, health risk assessments conducted for construction activities that would occur for shorter periods than the currently established methodologies for conducting health risk assessments (i.e., 9-, 40-, and 70-year exposure periods) could result in difficulties with producing accurate estimates of health risks. The proposed project's construction activities would be anticipated to last approximately 36 months, or approximately 1/3 of the minimum exposure period (i.e., 9 years) recommended for health risk assessments. Nevertheless, for the purposes of this analysis, and in anticipation of possible adoption of the *Draft Air Quality Guidelines*, a health risk assessment and PM<sub>2.5</sub> analysis for the project's construction activities was performed by ENVIRON.<sup>61</sup>

The health risk assessment and PM<sub>2.5</sub> analyses were conducted using project-related construction information provided by the project sponsor. This construction information was similar to that used to quantify construction-related mass emissions for Impact AQ-1 above. ENVIRON calculated mass emissions of PM<sub>10</sub>, which was used as a surrogate for diesel PM, and PM<sub>2.5</sub> exhaust from on-site heavy-duty construction equipment. The estimated mass emissions were entered into the Industrial Source Complex Short-term (ISC3ST) dispersion model to estimate ambient concentrations of PM<sub>10</sub> (diesel PM) and PM<sub>2.5</sub> associated with the project's construction activities. Meteorological conditions used in ISC3ST

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<sup>60</sup> California Air Resources Board (ARB), 2005, *Air Quality and Land Use Handbook: A Community Health Perspective*, Sacramento, CA, Available: <http://www.arb.ca.gov/ch/landuse.htm>, Accessed December 2010.

<sup>61</sup> ENVIRON, 2010, Memorandum to MEA: *Quantitative Analysis of Construction Emissions Health Impacts for the Fairmont Hotel Project*, April 8, 2010. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.

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included every combination of stability class and wind speed to identify worst-case conditions.<sup>62</sup> According to the analysis performed by ENVIRON, the proposed project's construction-related TAC emissions would generate a cancer risk of 20 in a million and a non-cancer hazard index of 0.18 for the maximally exposed individual. In addition, PM<sub>2.5</sub> concentrations associated with the project's construction activities would reach an annual average of 1.0 µg/m<sup>3</sup>. Therefore, pursuant to the analysis performed by ENVIRON, the proposed project's construction-related TAC and PM<sub>2.5</sub> emissions would be considered potentially significant under BAAQMD's proposed *Draft Air Quality Guidelines*. As discussed above, the *Draft Air Quality Guidelines* have not been adopted and the proposed thresholds and methodologies to quantify the project's construction-related TAC and PM<sub>2.5</sub> impacts could be subject to revisions prior to final adoption. Therefore, this analysis is provided for informational purposes.

In anticipation of the future adoption of the *Draft Air Quality Guidelines* and proposed thresholds, ENVIRON investigated the potential for mitigation measures to reduce the construction-related TAC and PM<sub>2.5</sub> impacts to a less-than-significant level. As part of the health risk assessment and PM<sub>2.5</sub> analyses, ENVIRON determined that the use of Tier IV-compliant construction equipment for the entire construction fleet would reduce the project's construction-related increased cancer risk to 3.1 in a million and incremental PM<sub>2.5</sub> annual concentrations to 0.2 µg/m<sup>3</sup>. Thus, if BAAQMD adopts their *Draft Air Quality Guidelines* and proposed thresholds, the potentially significant construction-related TAC and PM<sub>2.5</sub> impacts could be reduced to a less-than-significant level with implementation of **Mitigation Measure M-AQ-Potential Construction Mitigation Under Proposed BAAQMD Draft Air Quality Guidelines**, below, which would require Tier IV equipment for the entire construction fleet. It should also be noted that implementation of the Basic Construction Mitigation Measures included in **Mitigation Measure M-AQ-1**, discussed above, would also help reduce construction-related diesel PM emissions.

#### M-AQ-Potential Construction Mitigation Under Proposed BAAQMD Draft Air Quality Guidelines

Should BAAQMD's proposed CEQA thresholds pertaining to construction-related TAC and PM<sub>2.5</sub> emissions be adopted, the project sponsor shall be required to use Tier IV-compliant construction equipment for the entire construction fleet.

#### Operation-Related TAC and PM<sub>2.5</sub> Impact Analysis [*Criterion G.d*]

As discussed in Impact AQ-4 above, implementation of the proposed project would not result in a net increase in TAC emissions (i.e., perchloroethylene) associated with dry cleaning facilities above existing

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<sup>62</sup> Ibid. A full description of modeling methodologies and parameters employed by ENVIRON are available for review as part of the memorandum.

conditions. In addition, the proposed project would not result in a net increase in generators operating on site and thus would not generate a constant or large source of TAC emissions. The proposed project would cause a slight net increase of TAC emissions associated with mobile sources, but would not cause a net increase of TAC emissions associated with area and stationary sources.

In anticipation of the future adoption of the BAAQMD's *Draft Air Quality Guidelines* and proposed thresholds, the local community PM<sub>2.5</sub> risk impacts of the project site were also evaluated using BAAQMD's proposed phased approach. In accordance with the phased approach, it was determined that the project site is not located within 1,000 feet of a "significant traffic roadway" (e.g., Highway 1, Highway 101, Highway 280) and therefore would not require further PM<sub>2.5</sub> analysis. In addition, the *Draft Air Quality Guidelines* suggest a PM<sub>2.5</sub> hazards threshold of 0.3 µg/m<sup>3</sup> for new project-level receptors. Pursuant to the Article 38 consistency analysis, the maximum PM<sub>2.5</sub> concentration modeled at the project site associated with existing roadway traffic plus the proposed project would be 0.15 µg/m<sup>3</sup>, which is less than the PM<sub>2.5</sub> hazards threshold. Therefore, if the BAAQMD's *Draft Air Quality Guidelines* and proposed thresholds are adopted, this impact would be less than significant.

#### **Cumulative Construction Criteria Air Pollutant and Precursor Impact Analysis [Criterion G.c]**

As discussed in Impact AQ-1 above, the project's construction-related emissions would not exceed any of the proposed new BAAQMD thresholds of significance. The BAAQMD *Draft Air Quality Guidelines* do not include significance thresholds for cumulative construction emissions. However, due to the temporary nature of construction emissions, if the project's emissions would be less than significant based on the project-level thresholds of significance, it can be expected that the cumulative impact would also be less than significant. In addition, the project's Construction Management Plan would include the proposed BAAQMD Basic Construction Mitigation Measures, discussed on p. IV.G-33, which are recommended for all projects whether or not construction-related emissions exceed the thresholds of significance. Therefore, even if the proposed new BAAQMD thresholds of significance are adopted, construction emissions associated with the proposed project would not result in a cumulatively considerable impact to air quality.

#### **Cumulative Operational Criteria Air Pollutant and Precursor Impact Analysis [Criterion G.c]**

As discussed in Impact AQ-2 above, the project's maximum daily operational emissions would not exceed any of the proposed new BAAQMD thresholds of significance. It should be noted that the

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proposed BAAQMD thresholds are average daily or maximum annual thresholds. However, if the project's maximum daily emissions would not exceed the average daily thresholds, they would also not be expected to exceed the annual thresholds. The BAAQMD *Draft Air Quality Guidelines* do not include separate significance thresholds for cumulative operational emissions. However, BAAQMD considers the proposed operational thresholds of significance as "...the emissions level above which a project's individual emissions would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions."<sup>63</sup> Therefore, even if the proposed new BAAQMD thresholds of significance are adopted, operational emissions associated with the proposed project would not result in a cumulatively considerable impact to air quality.

**Cumulative TAC and PM<sub>2.5</sub> Impact Analysis [Criterion G.d]**

Although the BAAQMD's proposed thresholds are not adopted at this time, they could be implemented and effective prior to certification of this EIR. The proposed project's community risk and cumulative impact analysis is provided below for existing stationary sources and on-road mobile sources from roadways. It should be noted this analysis is not required by the adopted BAAQMD *CEQA Guidelines* and is provided for informational purposes.

**Existing Stationary Sources**

The methods used to evaluate community impacts from stationary sources were based on the methods and examples shown in BAAQMD's *Draft Air Quality Guidelines* (December 2009), Section 5.2 (single source impacts) and 5.3 (cumulative impacts).

There are no major permitted stationary sources in the vicinity of the Fairmont Hotel complex (e.g., refinery, power plant). A list of minor permitted sources within 1,000 feet of the Fairmont Hotel complex was obtained from the San Francisco Department of Public Health (DPH), and is presented in **Table IV.G-8: Emissions from Permitted Existing Stationary Sources** below, along with the toxic air contaminant (TAC) annual emission rates provided by BAAQMD. A map showing the location of permitted sources within 1,000 feet of the proposed project is shown in **Figure IV.G-1: Permitted Sources within 1,000-ft Radius of Proposed Project**, p. IV.G-56.

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<sup>63</sup> BAAQMD, 2009 (December), p. 47.

**Table IV.G-8**  
**Emissions from Permitted Existing Stationary Sources**

Non-permitted Source	Address	Pollutant	Emissions (lb/year)
First Quality Cleaners	730 Bush Street	Perchloroethylene	744
Fairmont Hotel	950 Mason Street	Perchloroethylene	809
		Formaldehyde	1
The Ritz Carlton San Francisco	600 Stockton Street	Perchloroethylene	135
		Formaldehyde	80

*Note:*  
Evaluation of potential health impacts from non-permitted sources used TAC emissions data shown in this table. Because no existing health risk assessment is available for these, a screening-level health risk procedure was used to determine the maximum individual cancer risk (MICR) for a 70-year residential exposure (Tier 2 Screening Risk Assessment, SCAQMD, July 2005).

Source: BAAQMD 2010.

**Table IV.G-9: Screening-Level Cancer Risk from Permitted Existing Stationary Sources** below, presents the variables used in the screening analysis and the maximum individual cancer risk (MICR) based on the screening method.

**Table IV.G-9**  
**Screening-Level Cancer Risk from Permitted Existing Stationary Sources**

Name	Pollutant	Annual Emissions (tons/yr)	Distance to Fairmont (m)	MICR-Residential
First Quality Cleaners	Perchloroethylene	3.72E-01	244	2.40E-07
Fairmont Hotel	Perchloroethylene	4.05E-01	219	2.61E-07
	Formaldehyde	5.00E-04	219	3.23E-10
The Ritz Carlton San Francisco	Perchloroethylene	6.75E-02	247	4.36E-08
	Formaldehyde	4.00E-02	247	2.58E-08
MICR Total =				0.57E-06
Cancer Risk Significance Threshold				1.00E-05
<i>Exceed Proposed Significance Threshold?</i>				No

*Note:*  
Both perchloroethylene and formaldehyde use a cancer potency (CP) factor of 2.10E-02 mg/kg-day, a daily breathing rate (DBR) of 302 L/kg body weight-day, and exposure value factors (EVF) of 0.96 (unit less). Maximum annual emission rate (tons/yr) is specific for the source and TAC emitted. Neither perchloroethylene nor formaldehyde is a multi-pathway pollutant. Based on these results, the maximum individual cancer risk (MICR) is estimated to be 0.57 in one-million, which is considerably below the CEQA guidance threshold of 10 in one-million.

Source: BAAQMD 2010; Data modeled by AECOM in 2010.

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Figure IV.G-1: Permitted Sources within 1,000-ft Radius of Proposed Project



Non-cancer impacts were also determined based on a screening methodology. Perchloroethylene and formaldehyde contribute to both non-cancer chronic and non-cancer acute health hazard impacts because they affect the kidney and respiratory system, respectively. The chronic and acute hazard index (HI) is presented in **Table IV.G-10: Hazard Index Values from Permitted Existing Stationary Sources** below, based on total annual emissions for each TAC pollutant.

**Table IV.G-10**  
**Hazard Index Values from Permitted Existing Stationary Sources**

<b>TAC Pollutant</b>	<b>Chronic REL (µg/m3)</b>	<b>Acute REL (µg/m3)</b>	<b>Chronic HI</b>	<b>Acute HI</b>
Formaldehyde	3.00E+00	9.40E+01	0.0135	0.000431
Perchloroethylene	3.50E+01	2.00E+04	0.0241	0.0000422
Non-cancer health impact Significance Threshold			1.0	1.0
<i>Exceed Proposed Significance Threshold?</i>			No	No

*Source:* Data modeled by AECOM in 2010.

Based on the screening risk analysis, existing stationary sources within 1,000 feet would not present a significant community health risk impact for cancer risk or non-cancer chronic or acute impacts for the proposed new sensitive receptors on site (i.e., project residents).

### **On-Road Mobile Sources (PM<sub>2.5</sub>)**

An evaluation of local community risk and hazard impacts from on-road mobile sources has been conducted to determine the extent to which on-road sources would increase PM<sub>2.5</sub> concentration levels near the proposed sensitive receptor locations on site. This analysis was conducted in accordance with proposed BAAQMD *Draft Air Quality Guidelines* for evaluation of existing on-road sources.

New sensitive receptors (i.e., project residents) are proposed to be located at 950 Mason Street in San Francisco, California (the existing location of the Fairmont Hotel complex). Using traffic count data provided by the City of San Francisco Municipal Transportation Authority (SFMTA), all streets and roadways within a 1,000-foot radius with measured traffic counts were referenced to identify roadways with daily vehicle volume (vehicles per day) greater than 10,000. Based on SFMTA data, proposed new receptors would be located within 1,000 feet of a significant traffic volume roadway, identified as Taylor Street and Pine Street (volume measured at 17,943 vehicles, November 1, 2006). Table 5-2 in the BAAQMD *Draft Air Quality Guidelines*, presents incremental PM<sub>2.5</sub> concentration increases based on traffic volume from various highways at varying receptor distances. The major roadway in closest proximity to the proposed new receptors is U.S. Highway 101 (U.S. 101), located approximately 3,440

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feet west of the proposed project area. U.S. 101 is more than 1,000 feet from the proposed project; therefore, the PM<sub>2.5</sub> concentrations associated with its operation and the contribution of vehicle traffic are not included in the PM<sub>2.5</sub> analysis. Traffic volume and PM<sub>2.5</sub> concentration presented for U.S. 101 were used to estimate an equivalent concentration value for the Taylor Street/Pine Street intersection. Surrounding mobile-sources of PM<sub>2.5</sub> were combined with the project's contribution to determine the cumulative PM<sub>2.5</sub> concentration. The results are presented in **Table IV.G-11: PM<sub>2.5</sub> Impact Analysis for Proposed New Receptors** below.

**Table IV.G-11**  
**PM<sub>2.5</sub> Impact Analysis for Proposed New Receptors**

Significant Traffic Volume Roadway	Traffic Volume (vehicles/day)	Distance to/from New Receptor (in feet)	PM <sub>2.5</sub> Concentration <sup>1</sup> (µg/m <sup>3</sup> )	Equivalent PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) <sup>2</sup>
U.S. 101	216,200	>1,000		-
Taylor Street and Pine Street <sup>3</sup>	17,943	685	1.4	0.12
Powell, Mason, Sacramento, & California Streets	45,720	<50	0.15	0.15
Total PM <sub>2.5</sub> Concentration				0.27
Proposed PM <sub>2.5</sub> Significance Threshold				0.8
<i>Exceed Proposed Significance Threshold?</i>				No
<i>Notes:</i>				
1. Concentration value represents incremental increase based on U.S. 101 traffic volume at receptor distance of 700 feet.				
2. Equivalent PM <sub>2.5</sub> Concentration calculation = (17,943)*(1.4 µg/m <sup>3</sup> )/(216,200)				
3. Source: www.sfmta.com/cms/vhome/documents/VOLUME_web.pdf				

*Sources:* Bay Area Air Quality Management District (BAAQMD), 2009 (December), *Final Draft California Environmental Quality Act Draft Air Quality Guidelines*, op. cit.; Data modeled by DPH in 2010 and AECOM in 2009.

As discussed previously, pursuant to Article 38, a PM<sub>2.5</sub> analysis of the proposed project was conducted. This analysis found the modeled PM<sub>2.5</sub> concentration would be 0.15 µg/m<sup>3</sup> at proposed sensitive receptors. An additional analysis, was conducted for the proposed project to determine the proposed project's cumulative PM<sub>2.5</sub> contribution from local roadway traffic. This air quality assessment, conducted by the San Francisco Department of Public Health, included local roadway traffic under existing conditions and the contribution from the project's anticipated traffic. Similar to first analysis, the maximum PM<sub>2.5</sub> concentrations associated with local roadway traffic and the proposed project at the project site would be 0.15 µg/m<sup>3</sup>.<sup>64</sup> Therefore, the proposed project's contribution to roadway traffic in the vicinity of the proposed project would not result in a measurable increase in PM<sub>2.5</sub> concentrations,

<sup>64</sup> San Francisco City and County Department of Public Health Environmental Health Section, 2010, Email to George Lu, AECOM, from McLaughlin, stating that the project site would be below the action threshold with background roadway plus project traffic. March 29. This letter is available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.

since estimated PM<sub>2.5</sub> concentrations at proposed receptors would be the same with and without project-generated traffic (i.e., 0.15 µg/m<sup>3</sup>).<sup>65</sup> The combined PM<sub>2.5</sub> concentration as modeled at proposed sensitive receptors would be 0.27 µg/m<sup>3</sup>, which is well-below BAAQMD's proposed cumulative threshold of 0.8 µg/m<sup>3</sup>.

### **Cumulative TAC and PM<sub>2.5</sub> Conclusion**

Cancer risk due to roadways was determined using a similar methodology as PM<sub>2.5</sub> concentrations. Based on a lifetime excess cancer risk estimate of 0.12 in one-million, and the vehicle ratio of U.S. 101 to the highest volume roadways within 1,000 feet of the project site shown in Table IV.G-11 above, the cancer risk is estimated to be 0.01 in one-million due to PM<sub>2.5</sub> exposure from roadways. When combined with cancer risk from stationary sources, the cumulative cancer risk would be approximately 0.58 in one-million, which is considerably below the BAAQMD-proposed CEQA guidance threshold of 100 in one-million. Non-cancer impacts from roadways are shown in the BAAQMD guidelines to be 0.00 at the location of the proposed new on-site sensitive receptors' distance from roadways, and therefore would be less than BAAQMD's proposed cumulative threshold when combined with non-cancer risk from stationary sources (i.e., HI < 1.0). In addition, cumulative PM<sub>2.5</sub> concentrations would be well-below the proposed cumulative threshold of 0.8 µg/m<sup>3</sup>. Cumulative health risk and hazard impacts associated with siting of the proposed new sensitive receptors within the project site would be less than significant.

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<sup>65</sup> Ibid.

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