4.3 AIR QUALITY

This section includes a summary of applicable regulations, existing air quality conditions, and an analysis of potential short-term and long-term air quality impacts of the proposed project. The methods of analysis for short-term construction, long-term regional (operational), local mobile sources, and toxic air contaminant (TAC) emissions are consistent with the recommendations of the Placer County Air Pollution Control District (PCAPCD). In addition, mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

Because there are no established thresholds for analyzing greenhouse gas (GHG) emissions at the project level, and because the effect of GHG emissions as they relate to global climate change is inherently a cumulative and global issue, the impact of project-generated GHGs is discussed in the cumulative impact analysis included in Chapter 6 of this EIR (which includes cumulative impacts).

4.3.1 ENVIRONMENTAL SETTING

The proposed project site is located in the western portion of Placer County, California (western Placer County), which is under the local jurisdiction of the PCAPCD. Western Placer County is within the Sacramento Valley Air Basin (SVAB), which also comprises all of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba counties, and the eastern 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. Therefore, existing air quality conditions in the 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, as discussed separately below.

TOPOGRAPHY, CLIMATE, AND METEOROLOGY

The SVAB is relatively flat, bordered by the North Coast Ranges to the west and the Northern Sierra Nevada Mountains to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin River Delta from the San Francisco Bay area.

The Mediterranean climate type of the SVAB is characterized by hot, dry summers and cool, rainy winters. During the summer, daily temperatures range from 50°F to more than 100°F. The inland location and surrounding mountains shelter the area from much of the ocean breezes that keep the coastal regions moderate in temperature.

Most precipitation in the area results from air masses that move in from the Pacific Ocean, usually from the west or northwest during the winter months. More than half the total annual precipitation falls during the winter rainy season (November through February); the average winter temperature is a moderate 49°F. Characteristic of SVAB winters are also periods of dense and persistent low-level fog, which are most prevalent between storms. The prevailing winds are moderate in speed and vary from moisture laden breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution. The highest frequency of poor air movement occurs in the fall and winter when high-pressure cells are present over the SVAB. The lack of surface wind during these periods combined with the reduced vertical flow because of less surface heating reduces the influx of air and leads to the concentration of air pollutants under stable metrological conditions. Surface concentrations of air pollutant emissions are highest when these conditions occur in combination with agricultural burning activities or temperature inversions which hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

May through October is ozone season in the SVAB. This period is characterized by poor air movement in the mornings with the arrival of the delta sea breeze from the southwest in the afternoons. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and nitrogen oxides (NO_X), which result in ozone formation. Typically, the delta breeze transports air pollutants northward out of the SVAB; however, a phenomenon known as the Schultz Eddy prevents this from occurring during approximately half of the time from July to September. The Schultz Eddy phenomenon causes the wind pattern to shift southward resulting in air pollutants being blown back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the area and contributes to violations of the ambient air quality standards.

Local meteorology of the proposed project site is represented by measurements recorded at the Rocklin station. January temperatures range from a normal minimum of 34°F to a normal maximum of 54°F. July temperatures range from a normal minimum of 59°F to a normal maximum of 96°F (National Oceanic and Atmospheric Administration 1992). The predominant wind direction and speed is from the south-southwest at 10 mph (ARB 1994).

EXISTING AIR QUALITY - CRITERIA AIR POLLUTANTS

Concentrations of the following air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as “criteria air pollutants.”

A brief description of each criteria air pollutant including source types, health effects, and future trends is provided below along with the most current attainment area designations and monitoring data for the project area.

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_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X is a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. This is the ozone commonly known as “ground-level” ozone. 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 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. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004).

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 parts 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, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms 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 the permeability of respiratory epithelia; such increased permeability leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system's ability to defend against infection (Godish 2004).

Emissions of ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. Consequently, peak 1-hour and 8-hour ozone concentrations in the SVAB have declined overall by about 15% since 1988. However, peak ozone values in the SVAB have not declined as rapidly over the last several years as they have in other urban areas. This can be attributed to influx of pollutants into the SVAB from other urbanized areas, making the region both a transport contributor and a receptor of pollutants (ARB 2009a).

Carbon Monoxide

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the nationwide CO emissions are from mobile sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

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 (EPA 2009a).

The highest concentrations are generally associated with cold stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 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_2 (EPA 2009a). The combined emissions of NO and NO_2 are referred to as NO_X, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 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 with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 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_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions.

Sulfur Dioxide

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 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_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} 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_2 and ROG (EPA 2009a). Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (ARB 2009a).

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAH), and other toxic substances adsorbed onto fine particulate matter, which is referred to as the piggybacking effect, or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} 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 (EPA 2009a). $PM_{2.5}$ 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 both PM_{10} and $PM_{2.5}$ have increased in the SVAB between 1975 and 2000 and are projected to increase through 2020. Of the three source types: mobile, stationary, and area, particulate matter emissions are dominated by area-wide sources, primarily because of construction and related urban development activities. The past and projected increases in particulate matter emissions are largely attributable to these area sources. Direct emissions of PM from mobile and stationary sources, however, have remained relatively steady (ARB 2009a).

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 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 U.S. Environmental Protection Agency (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 (EPA 2009a).

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78% 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 (EPA 2009a).

Ambient Air Quality – Monitoring Station Data and Attainment Designations

Criteria air pollutant concentrations are measured at several monitoring stations in the SVAB. The Roseville-North Sunrise Boulevard station is the closest in proximity to the proposed project site with recent data for ozone,

NO_2, $PM_{2.5}$ and PM_{10}. The North Highlands-Blackfoot Way monitoring station is the closest to the proposed project with recent data for CO. In general, the ambient air quality measurements from these stations are representative of the air quality in the vicinity of the proposed project site. Table 4.3-1 summarizes the air quality data from the most recent 3 years reported.

Table 4.3-1
Summary of Annual Ambient Air Quality Data (2006–2008)[1]

	2006	2007	2008
Roseville-North Sunrise Boulevard Monitoring Station			
Ozone			
Maximum concentration (1-hr/8-hr, ppm)	0.121/ 0.098	0.109/ 0.101	0.134/ 0.107
Number of days state standard exceeded (1-hr)	16	4	20
Number of days national/state standard exceeded (8-hr)	25/38	8/20	22/38
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hr, ppm)	0.063	0.058	0.065
Number of days state standard exceeded (1-hr)	0	0	0
Fine Particulate Matter ($PM_{2.5}$)			
Maximum concentration ($\mu g/m^3$)	54.7	48.7	149.7
Number of days national standard exceeded (measured/calculated[2])	2/11.5	0/0	1/0
Respirable Particulate Matter (PM_{10})			
Maximum concentration ($\mu g/m^3$)	55.0	45.0	73.9
Number of days state standard exceeded (measured/estimated[2])	1/5.8	0/0	1/0
Number of days national standard exceeded (measured/estimated[2])	0/0	0/0	0/0
North Highlands-Blackfoot Way Monitoring Station			
Carbon Monoxide (CO)			
Maximum concentration (1-hr/8-hr, ppm)	7.5/2.7	5.1/1.7	2.3/1.8
Number of days state standard exceeded (8-hr)	0	0	0
Number of days national standard exceeded (1-hr/8-hr)	0/0	0/0	-

[1] Where, $\mu g/m^3$ = micrograms per cubic meter and ppm = parts per million.
[2] Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard; Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.
Sources: ARB 2009b, EPA 2009b

Both the California Air Resources Board (ARB) and EPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most current attainment designations for the western Placer County portion of the SVAB are shown in Table 4.3-2 for each criteria air pollutant.

EXISTING AIR QUALITY - TOXIC AIR CONTAMINANTS

Concentrations of TACs 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 in 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.

Table 4.3-2
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Ozone	1-hour	0.09 ppm (180 μg/m^3)	N(Serious)	–	Same as Primary Standard	–
	8-hour	0.070 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		N(Serious)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	A	0.053 ppm (100 μg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 μg/m^3)		–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 μg/m^3)	–	U
	24-hour	0.04 ppm (105 μg/m^3)	A	0.14 ppm (365 μg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 μg/m^3)	
	1-hour	0.25 ppm (655 μg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 μg/m^3	N	–	Same as Primary Standard	U
	24-hour	50 μg/m^3		150 μg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m^3	N	15 μg/m^3	Same as Primary Standard	N[9]
	24-hour	–	–	35 μg/m^3		
Lead[9]	30-day Average	1.5 μg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 μg/m^3	Same as Primary Standard	

Table 4.3-2
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Sulfates	24-hour	25 μg/m^3	A		**No National Standards**	
Hydrogen Sulfide	1-hour	0.03 ppm (42 μg/m^3)	U			
Vinyl Chloride[9]	24-hour	0.01 ppm (26 μg/m^3)	U/A			
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%.	U			

[1] National standards (other than ozone, PM, 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 PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter (μg/m^3)]. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°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.

[4] Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.
State 1-Hour Ozone Nonattainment Classification (Serious): .0.13 to 0.15 parts per million, inclusive.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] EPA designated areas for federal $PM_{2.5}$ nonattainment, which became final in December 2008.

[9] 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: ARB 2009c and 2009d EPA 2009c

According to the California Almanac of Emissions and Air Quality (ARB 2009a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM 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 no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risk, for which data are available, in California.

Diesel PM poses the greatest health risk among these ten TACs mentioned. Based on receptor modeling techniques, the ARB estimated its health risk to be 360 excess cancer cases per million people in the SVAB. Since 1990, the diesel PM's health risk has been reduced by 52%. Overall, levels of most TACs have gone down since 1990 except for *para*-dichlorobenzene and formaldehyde (ARB 2009a).

Existing Sources

Stationary

According to ARB, the only major stationary sources of TAC emissions located near the project site are Sierra Pine, LTD located approximately 1 mile to the northwest of the project site (ARB 2009d). This industrial facility is subject to PCAPCD's permit requirements involving Best Available Control Technology for toxics (T-BACT) and offset requirements.

Mobile Sources

Existing sources of TACs also include mobile sources (i.e., diesel-fueled internal combustion engines) on nearby roadways (e.g., Interstate 80, which borders the north boundary of the project site). According to ARB, on-road diesel-fueled vehicles contribute approximately 24% of the statewide total of TAC emissions, with an additional 71% attributed to other mobile sources such as construction, mining, and agricultural equipment; and transport refrigeration units.

ASBESTOS

Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin, but strong and durable fibers. Naturally occurring asbestos (NOA), which was identified as a TAC in 1986 by ARB, is located in many parts of California, including several foothill areas of Placer County, and are commonly associated with serpentine.

For individuals living in areas of NOA, there are many potential pathways for airborne exposure. Exposures to soil dust containing asbestos can occur under a variety of scenarios, including children playing in the dirt, dust raised from unpaved roads and driveways covered with crushed serpentine, uncontrolled quarry emissions, grading and construction associated with development of new housing, gardening, and other human activities. For homes built on asbestos outcroppings, asbestos can be tracked into the home and can also enter as fibers suspended in outdoor air. Once such fibers are indoors, they can be entrained into the air by normal household activities, such as vacuuming (as many fibers will simply pass through vacuum cleaner bags).

The general public exposed to low levels of asbestos may be at elevated risk (e.g., above background rates) of lung cancer and mesothelioma. The risk is proportional to the cumulative inhaled dose (number of fibers), and also increases with the time since first exposure. Although there are a number of factors that influence the diseasecausing potency of any given asbestos, such as fiber length and width, fiber type, and fiber chemistry, all forms are carcinogens.

Geologic maps prepared by the California Geologic Survey (formerly the California Division of Mines and Geology) show areas of higher probability for asbestos containing rock within the broad zone of faults that follows the low foothills and lay in a south-east to north-west band. The Placer County communities of Auburn, Colfax, Meadow Vista, and Foresthill are among those that are within this fault band. Generally, there are no areas of high probability of occurrence for NOA in Placer County that lay neither to the west of Folsom Lake nor to the south of Wise Road. That is, Roseville (and Granite Bay), Rocklin, Lincoln, Loomis, Penryn, and Newcastle lay within geologic areas that have a lower probability for the presence of NOA.

The identification of locations in Placer County has been improved with the development of an enhanced 1:1,100,000 scale map by the California Geological Survey. The map denotes areas of Placer County that are more or less likely to contain NOA that is based on available soil and geologic studies, with some field verification.

The characterization of an area as having a lower overall probability of NOA presence means that although the likelihood is slight, in some instances NOA might be found within such an area. Similarly, a location in the area identified as being most likely to have NOA may not contain NOA.

NOA deposits have been found in rock other than ultramafic and serpentine rock; for example NOA deposits have been found in metavolcanic rocks such as the Copper Hill Volcanics in the Folsom vicinity. Metavolcanic rock formations are prevalent to the northeast, north, and west of Auburn. Finally in areas of sedimentary of alluvial rock deposits, such as exist in western Placer County; it is possible that analytically detectible NOA may be found.

According to Special Report 190: Relative Likelihood for the Presence of Naturally Occurring Asbestos in Placer County, California (Higgins and Clinkenbeard 2006) and the General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos (Churchill and Hill 2000), the proposed project site is not located in an area that is likely to contain NOA.

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).

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 cause complaints than a familiar one. This is because of the 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.

There are no major existing sources of odors in the project vicinity (e.g., wastewater treatment facilities, food processing plant, etc.). Potential minor sources of odors which could adversely affect receptors within the proposed project area include diesel exhaust emissions from vehicles on Interstate 80 (I-80), immediately north of the project site. In addition, commercial development is approved on an adjacent parcel to the west of the project site, and could introduce odor sources to the area associated with possible food-preparation tenants (e.g., odors associated with charbroilers and trash receptacles).

4.3.2 REGULATORY SETTING

Air quality within Placer County is regulated by such agencies as EPA, ARB, and PCAPCD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

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

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 4.3-2, EPA has established primary and secondary NAAQS for the following criteria air pollutants:

- ozone,
- CO,
- NO_2,
- SO_2,
- PM_{10},
- $PM_{2.5}$, and
- lead.

The primary standards protect the public health and the secondary standards protect public welfare. 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 periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformation to the mandates of the CAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Toxic Air Contaminants

Air quality regulations also focus on TACs, or in federal parlance hazardous air pollutants (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 the ambient standards have been established (Table 4.3-2). Instead, EPA and ARB regulate HAPs and 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 the PCAPCD, establish the regulatory framework for TACs.

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), 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), EPA is required to promulgate health risk–based emissions standards, where deemed necessary, to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, 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 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

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 the ARB to establish California ambient air quality standards (CAAQS) (Table 4.3-2). 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.

Other ARB responsibilities include, but are not limited to, overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to 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.

State Toxic Air Contaminant Programs

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

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, 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-emission inventory, prepare 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 more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for 1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines; 2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and 3) reporting requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Thus, with the turnover of vehicle fleets TACs emissions will substantially decrease in the future in comparison to current conditions. Mobile-source emissions of TACs (i.e., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures [e.g., Low Emission Vehicle (LEV)/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

ARB published the Air Quality and Land Use Handbook: A Community Health Perspective, which provides guidance concerning land use compatibility with TAC sources (ARB 2005). While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors 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 keep children and other sensitive populations out of harm's way. A number of comments on the Handbook were provided to ARB by air districts, other agencies, real estate representatives, and others. The comments included concern over whether the ARB was playing a role in local land use planning, the validity of relying on static air quality conditions over the next several decades in light of technological improvements, and support for providing information that can be used in local decision making.

LOCAL PLANS, POLICIES, REGULATIONS, AND LAWS

Placer County Air Pollution Control District

PCAPCD attains and maintains air quality conditions in Placer 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 PCAPCD 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. PCAPCD 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. Air quality plans applicable to the proposed project are discussed below.

As mentioned above, PCAPCD adopts rules and regulations. All projects are subject to PCAPCD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include, but are not limited to:

- ***Rule 202-Visible Emissions.*** A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade as that designated as number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.

- ***Rule 205-Nuisance***. A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause to have a natural tendency to cause injury or damage to business or property. The provisions of Rule 205 do not apply to odors emanating from agriculture operations necessary for the growing of crops or raising of fowl or animals.

- ***Rule 217-Cutback and Emulsified Asphalt Paving Materials.*** A person shall not manufacture for sale nor use for paving, road construction or road maintenance any: rapid cure cutback asphalt; slow cure cutback asphalt containing organic compounds which evaporate at 500°F or lower as determined by current American Society for Testing and Materials (ASTM) Method D402; medium cure cutback asphalt except as provided in Section 1.2.; or emulsified asphalt containing organic compounds which evaporate at 500°F or lower as determined by current ASTM Method D244, in excess of 3% by volume.

- ***Rule 218-Application of Architectural Coatings.*** No person shall manufacture, blend, or repackage for sale within PCAPCD; supply, sell, or offer for sale within PCAPCD; or solicit for application or apply within the PCAPCD, any architectural coating with a volatile organic carbon (VOC) content in excess of the corresponding specified manufacturer's maximum recommendation.

- ***Rule 228-Fugitive Dust.***

  - ***Visible Emissions Not Allowed Beyond the Boundary Line:*** A person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area (including disturbance as a result of the raising and/or keeping of animals or by vehicle use), such that the presence of such dust remains visible in the atmosphere beyond the boundary line of the emission source.

  - ***Visible Emissions from Active Operations:*** In addition to the requirements of Rule 202, Visible Emissions, a person shall not cause or allow fugitive dust generated by active operations, an open storage pile, or a disturbed surface area, such that the fugitive dust is of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke as dark or darker in shade as that designated as number 2 on the Ringelmann Chart, as published by the United States Bureau of Mines.

  - ***Concentration Limit:*** A person shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter ($\mu g/m^3$) (24-hour average) when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other EPA-approved equivalent method for PM_{10} monitoring.

  - ***Track-Out onto Paved Public Roadways:*** Visible roadway dust as a result of active operations, spillage from transport trucks, and the track-out of bulk material onto public paved roadways shall be minimized and removed.

    - The track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventative measures, and removed within one hour from adjacent streets anytime such material track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations.

    - All visible roadway dust tracked-out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a High Efficiency Particulate Air (HEPA) filter equipped vacuum device shall be used for roadway dust removal.

  - Any material tracked-out, or carried by erosion, and clean-up water, shall be prevented from entering waterways or storm water inlets as required to comply with water quality control requirements.

- ***Minimum Dust Control Requirements:*** The following dust mitigation measures are to be initiated at the start and maintained throughout the duration of the construction or grading activity, including any construction or grading for road construction or maintenance.

  - Unpaved areas subject to vehicle traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered.

  - The speed of any vehicles and equipment traveling across unpaved areas must be no more than 15 miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust exceeding Ringelmann 2 or visible emissions from crossing the project boundary line.

  - Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile.

  - Prior to any ground disturbance, including grading, excavating, and land clearing, sufficient water must be applied to the area to be disturbed to prevent emitting dust exceeding Ringelmann 2 and to minimize visible emissions from crossing the boundary line.

  - Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt, from being released or tracked offsite.

  - When wind speeds are high enough to result in dust emissions crossing the boundary line, despite the application of dust mitigation measures, grading and earthmoving operations shall be suspended.

  - No trucks are allowed to transport excavated material off-site unless the trucks are maintained such that no spillage can occur from holes or other openings in cargo compartments, and loads are either covered with tarps; or wetted and loaded such that the material does not touch the front, back, or sides of the cargo compartment at any point less than six inches from the top and that no point of the load extends above the top of the cargo compartment.

- ***Wind-Driven Fugitive Dust Control:*** A person shall take action(s), such as surface stabilization, establishment of a vegetative cover, or paving, to minimize wind-driven dust from inactive disturbed surface areas.

► ***Rule 501-General Permit Requirement:*** Any person operating an article, machine, equipment or other contrivance, the use of which may cause, eliminate, reduce, or control the issuance of air contaminants, shall first obtain a written permit from the Air Pollution Control Officer (APCO). Stationary sources subject to the requirements of Rule 507, Federal Operating Permit Program, must also obtain a Title V permit pursuant to the requirements and procedures of that rule.

Air Quality Plans

PCAPCD, in coordination with the air quality management districts and air pollution control districts of El Dorado, Sacramento, Solano, Sutter, and Yolo counties, prepared and submitted the 1991 Air Quality Attainment Plan (AQAP) in compliance with the requirements set forth in the CCAA, which specifically addressed the nonattainment status for ozone and to a lesser extent, CO and PM_{10}. The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of the assessment, the attainment plan must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The requirement of the CCAA for a first triennial progress report and revision of the 1991 AQAP was fulfilled with the preparation and adoption of the 1994 Ozone Attainment Plan (OAP). The OAP stresses attainment of ozone standards and focuses on strategies for reducing ozone precursor emissions of ROG and NO_X. It promotes active public involvement, enforcement of compliance with PCAPCD rules and regulations, public education in both the public and private sectors, development and promotion of transportation and land use programs designed to reduce vehicle miles traveled (VMT) within the region, and implementation of stationary and mobile-source control measures. The OAP became part of the SIP in accordance with the requirements of the CAAA and amended the 1991 AQAP. However, at that time the region could not show that the national ozone (1-hour) standard would be met by 1999. In exchange for moving the deadline to 2005, the region accepted a designation of "severe nonattainment" coupled with additional emission requirements on stationary sources. Additional triennial reports were also prepared in 1997, 2000, and 2003 in compliance with the CCAA that act as incremental updates.

As a nonattainment area, the region is also required to submit rate-of-progress milestone evaluations in accordance with the CAAA. Milestone reports were prepared for 1996, 1999, and 2002. These milestone reports include compliance demonstrations that the requirements have been met for the Sacramento nonattainment area. The air quality attainment plans and reports present comprehensive strategies to reduce ROG, NO_X, and PM_{10} emissions from stationary, area, mobile, and indirect sources. Such strategies include the adoption of rules and regulations; enhancement of CEQA participation; implementation of a new and modified indirect source review program; adoption of local air quality plans; and stationary-, mobile-, and indirect-source control measures.

In July of 1997, the EPA promulgated a new 8-hour ozone standard. This change lowered the standard for ambient ozone from 0.12 ppm averaged over one hour to 0.08 ppm averaged over eight hours. In general, the 8-hour standard is more protective of public health and more stringent than the 1-hour standard. The promulgation of this standard prompted new designations and nonattainment classifications in June 2004, and resulted in the revocation of the 1-hour standard in June 2005. The region has been designated as a nonattainment (serious) area for the national (8-hour) ozone standard with an attainment deadline of June 2013.

The region has made significant progress in reducing ozone. However, the region requires longer-term emission reduction strategies to meet attainment. The Sacramento Federal Nonattainment Area (SFNA) requested that the ARB submit a formal request for voluntary reclassification from a "serious" to a "severe" for the 8-hour ozone nonattainment area with an associated attainment deadline of June 15, 2019, which is allowed under the CAA. ARB submitted that request in February 2008. The SFNA is currently in the process of updating the 8-hour ozone plan, and the plan is scheduled to be submitted to ARB and EPA in March 2009 (SMAQMD 2009).

Local Toxic Air Contaminant Programs

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under PCAPCD Rule 501 (General Permit Requirements), Rule 502 (New Source Review), and Rule 507 (Federal Operating Permit), all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. PCAPCD limits emissions and public exposure to TACs through a number of programs. PCAPCD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Sources that require a permit are analyzed by PCAPCD (e.g., health risk assessment [HRA]) based on their potential to emit toxics. A HRA is a tool used to determine the exposure of sensitive receptors to TAC emissions based on a 70-year exposure period. If it is determined that the project will emit toxics in excess of PCAPCD's threshold of significant for TACs, as identified below, sources have to implement the best available control technology for TACs (T-BACT) in order to reduce emissions. If a source cannot reduce the risk below the threshold of significance even after T-BACT has been implemented, PCAPCD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. It is important to note that the air quality permitting process applies to stationary sources; and properties, which may be exposed to elevated levels of non-stationary type sources of TACs, and the non-stationary type sources themselves (e.g., on-road mobile) are not subject to this process or any requirements of T-BACT implementation. Rather, emissions controls on such sources (e.g., vehicles) are subject to regulations implemented on the state and federal level.

City of Rocklin

The following policy is applicable to the proposed project (City of Rocklin 1991):

- Policy 25. To coordinate and cooperate with the Placer County Air Pollution District in the development of stationary and mobile source control measures affecting the City of Rocklin, to be included in the California Clean Air Act Plan for Placer County (Rocklin Circulation Element).

In addition, Appendix C to the General Plan outlines mitigation measures to be used whenever dealing with roadways in the Rocklin Circulation Element. These mitigation measures and others are used in this EIR, where applicable. Along with this list of specific mitigation measures, Appendix C also makes the following reference to certain land use and circulation policies that would reduce air pollutant emissions:

- C-20. Land Use Element Policy 12 and Circulation Policies 3, 5, 6, 10, 12, 17 and 18 to reduce emissions associated with new developments shall apply.

For the reader's reference, the applicable policies from the General Plan list above are included below:

- 3. To require bike lanes in the design and construction of major new street and highway improvements, and to establish bike lanes on those City streets wide enough to accommodate bicycles safely.

- 6. To promote pedestrian convenience through development conditions requiring sidewalks, walking paths, or hiking trails that connect residential areas with commercial, shopping, and employment centers.

- 10. To promote the use of public transit through development conditions requiring park-and-ride lots, bus turnouts and passenger shelters along major streets.

4.3.3 IMPACTS AND MITIGATION MEASURES

METHODOLOGY

Short-term construction-generated criteria air pollutant (e.g., PM_{10}) and ozone precursor emissions (ROG and NO_X) were assessed in accordance with PCAPCD-recommended methods. Emissions were modeled using the Urban Emissions (URBEMIS) 2007 Version 9.2.4 computer model, and other emission factors and recommended methodologies from PCAPCD. Modeling was based on project-specific data (e.g., estimated duration of construction, size, and type of proposed land uses) and URBEMIS default settings for the SVAB.

Long-term (i.e., operational) regional criteria air pollutant and precursor emissions, including mobile- and area-source emissions, were also quantified using URBEMIS 2007. Modeling was based on project-specific data (e.g., size and type of proposed uses), URBEMIS default settings for the SVAB, and trip generation data from the traffic analysis (LSA 2007). Long-term stationary source emissions were qualitatively assessed in accordance with PCAPCD-recommended methodologies.

All other air quality impacts (i.e., local mobile-source, odor, and TAC emissions) were assessed in accordance with ARB and PCAPCD-recommended methodologies. Such methodologies include the use of a screening level procedure for local mobile-source CO concentrations and TAC exposure, and a qualitative assessment for the exposure of sensitive receptors to odors.

In addition, public health impacts associated with locating the project adjacent to I-80 were analyzed in a HRA. Methodology for the HRA is based on ARB and EPA emission factors, EPA dispersion models, and traffic data provided by the California Department of Transportation (Caltrans) and the Sacramento Area Council of Governments (SACOG). In addition to cancer risks, chronic and acute non-cancer risks were assessed.

The net increase in carbon dioxide (CO_2) emissions generated by the project would be primarily associated with a net increase in motor vehicle trips. CO_2 emissions from project construction, mobile-, and area-source emissions were estimated using URBEMIS, and emission factors from the California Climate Action Registry for off-site electricity generation associated with electricity and water consumption by the proposed project.

Please refer to Section 6 of this EIR for a discussion of GHG emissions of the project and climate change impacts.

THRESHOLDS OF SIGNIFICANCE

Per Appendix G of the CEQA Guidelines, and recommendations of PCAPCD, air quality impacts are considered significant if implementation of the proposed project under consideration would do any of the following:

- Generate (directly or indirectly through automobile trip generation) criteria air pollutant or precursor emissions in excess of significance thresholds developed by PCAPCD [i.e., 82 pounds/day (lb/day) of ROG, NO_X, or PM_{10}; or 550 lb/day of CO)];
- Conflict with adopted environmental plans, policies, or regulations for air pollutants;
- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Cause or contribute to local CO concentrations exceeding 20 ppm over a one-hour averaging period or 9 ppm over an eight-hour averaging period;
- Expose sensitive receptors to substantial pollutant concentrations;
- . . Create or expose a substantial number of people to objectionable odors; or,
- Result in a cumulatively considerable net increase of any criteria pollutant or precursor for which the project region is designated nonattainment under an applicable national or State ambient air quality standard (see Chapter 6 of this EIR, which addresses cumulative impacts). PCAPCD has adopted an operational cumulative threshold of 10 lb/day of ROG or NO_X, to apply during summer months only.

IMPACTS AND MITIGATION MEASURES

IMPACT 4.3-1 **Short-Term Construction-Generated Criteria Air Pollutant and Precursor Emissions.** *The short-term construction-generated emissions of PM_{10} would exceed PCAPCD's significance threshold of 82 lb/day during the site preparation phase of construction. This is considered a* ***significant*** *impact.*

Construction emissions are described as "short-term" or temporary in duration and have the potential to represent a significant impact with respect to air quality, especially fugitive PM_{10} dust emissions. Fugitive PM_{10} dust emissions are associated primarily with ground disturbance activities during site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT on- and offsite. Exhaust emissions from employee commute trips and construction equipment also contribute to short-term increases in PM_{10} emissions but to a much lesser extent. Emissions of ozone precursor emissions (ROG and NO_X) and CO are primarily associated with exhaust emissions from employee commute trips and construction equipment, application of architectural coatings, and asphalt paving.

With respect to the proposed project, the initial site preparation and building phases of construction would result in the temporary generation of ROG, NO_X, CO, PM_{10}, and $PM_{2.5}$ (a subset of PM_{10}) emissions from ground disturbance activities, use of off-road equipment, employee commute trips, and other miscellaneous activities (e.g., asphalt paving and the application of architectural coatings).

Short-term construction emissions of ROG, NO_X, PM_{10}, $PM_{2.5}$, and CO were modeled using the URBEMIS 2007 Version 9.2.4 computer program, as recommended by PCAPCD. URBEMIS is designed to model construction emissions for development projects and allows for the input of project-specific information. Input parameters were based on default model settings, information provided in the Project Description, and District Guidance where project specific information was not available. The modeled maximum daily construction emissions are summarized in Table 4.3-3 and described in more detail below and in Appendix C.

Based on the modeling conducted, project construction would result in worst-case maximum unmitigated daily emissions of approximately 29 lb/day of ROG, 74 lb/day of NO_X, 303 lb/day of PM_{10}, and 68 lb/day of CO. Daily unmitigated construction-generated emissions would not exceed PCAPCD's significance thresholds of 82 lb/day for ROG or NO_X or 550 lb/day for CO. However, unmitigated construction-generated emissions of PM_{10} would exceed PCAPCD's significance threshold of 82 lb/day during the site preparation phase. In addition, PCAPCD dust control measures, which are required for all construction projects, are not included in the project description. Thus, PM_{10} emissions could violate an air quality standard or contribute substantially to an existing or projected air quality violation, considering Placer County's nonattainment status. As a result, this impact is considered **significant**.

Table 4.3-3
Summary of Modeled Maximum Daily Short-term Construction-Generated Emissions

Source	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)[1]	CO (lb/day)
Site Preparation Phase (Summer 2010)					
Mobile Equipment Exhaust	4.2	33.7	1.8	1.7	17.5
Worker Commute	-	0.1	-	-	1.2
Fugitive Dust	-	-	298.4	62.3	-
Building Construction Phase (Summer 2010–Winter 2012)					
Mobile Equipment Exhaust	6.9	38.6	2.9	2.7	23.5
Worker Commute	0.8	1.4	0.2	0.1	25.5
Architectural Coatings (Off-Gassing)	16.5	-	-	-	-
Asphalt (Off-Gassing)	0.1	-	-	-	-
Total Unmitigated Emissions	**28.5**	**73.7**	**303.3**	**66.8**	**67.7**
PCAPCD Significance Threshold	82	82	82	N/A	550
Exceed Threshold?	No	No	Yes	-	No

[1] $PM_{2.5}$ is a subset of PM_{10}. PCAPCD does not have an adopted threshold for $PM_{2.5}$; however, because the project area is designated nonattainment for $PM_{2.5}$, emissions were provided for informational purposes.

Emissions modeled using the URBEMIS 2007 (v 9.2.4) computer model, based on the proposed land uses and phasing information identified in the project description and default model settings. The modeling assumes a somewhat shorter construction schedule, but the results would be very similar for the currently anticipated construction schedule.

Refer to Appendix C for detailed assumptions and modeling output files.

Source: Data modeled by EDAW 2009.

Mitigation Measure 4.3-1: Short-Term Construction-Generated Criteria Air Pollutant and Precursor Emissions.

In accordance with the PCAPCD, the applicant shall comply with all applicable rules and regulations as discussed previously, in addition to implementation of the following recommended mitigation measures during construction of the proposed project (Backus, pers. comm., 2006).

1. The applicant shall submit to the City Engineer and PCAPCD and receive approval of a Construction Emission / Dust Control Plan prior to groundbreaking. This plan must address the minimum requirements of sections 300 and 400 of Rule 228-Fugitive Dust.

2. The applicant shall suspend all grading operations when fugitive dust emissions exceed District Rule 228-Fugitive Dust limitations.

3. Fugitive dust emissions shall not exceed 40% opacity and shall not go beyond property boundary at any time. If lime or other drying agents are utilized to dry out wet grading areas they shall be controlled as to not to exceed District Rule 228-Fugitive Dust limitations.

4. Construction equipment exhaust emissions shall not exceed Rule 202-Visible Emission limitations.

5. The project applicant shall ensure compliance with all of PCAPCD's minimum dust requirements.

6. Water shall be applied to control fugitive dust, as needed, to prevent impacts offsite. Operational water trucks shall be onsite to control fugitive dust. Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt from being released or tracked off-site.

7. PCAPCD-approved chemical soil stabilizers, vegetative mats, or other appropriate best management practices, in accordance with manufacturers' specifications, shall be applied to all-inactive construction areas (previously graded areas which remain inactive for 96 hours).

8. Soil binders shall be spread on unpaved roads and employee/equipment parking areas, and streets shall be washed (e.g., wet broom) if silt is carried over to adjacent public thoroughfares.

9. Open burning of any kind shall be prohibited.

10. Minimize idling time to five minutes for all diesel-fueled equipment.

11. Use ARB diesel fuel for all diesel-powered equipment.

12. The prime contractor shall submit to PCAPCD a comprehensive inventory (i.e., make, model, year, emission rating) of all the heavy-duty off-road equipment (50 horsepower or greater) that will be used an aggregate of 40 or more hours for the construction project. The project representative shall provide PCAPCD with the anticipated construction timeline including start date, name, and phone number of the project manager and onsite foreman. The project shall provide a plan for approval by the District demonstrating that the heavy-duty (> 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project-wide fleet-average 20% NO_X reduction and 45% particulate reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available. Contractors can access the Sacramento Metropolitan Air Quality Management District's website to determine it their off-road fleet meets the requirements listed in this measure. http://www.airquality.org/ceqa/index.shtml#construction.

Level of Significance after Mitigation

Compliance with the above PCAPCD-required control measures would reduce worst-case fugitive PM_{10} dust emissions by approximately75%, to approximately 76 lb/day, below the threshold of 82 lb/day, and prevent dispersion, thereof, beyond the property boundary. Implementation of the above mitigation measures would reduce short-term construction-generated emissions to a **less-than-significant** level.

IMPACT 4.3-2 Long-Term Operational (Regional) Criteria Air Pollutant and Precursor Emissions. *The proposed project would increase criteria air pollutant and precursor emissions in the region, but at a rate below applicable significance thresholds and therefore, this impact is considered* ***less than significant.***

Regional area- and mobile-source emissions of ROG, NO_X, PM_{10}, $PM_{2.5}$, and CO associated with implementation of the proposed project were estimated using URBEMIS, which is designed to model emissions for development projects. URBEMIS allows land use selections that include project location specifics and trip generation rates. URBEMIS accounts for area-source emissions from the usage of natural gas, fireplaces, landscape maintenance equipment, and consumer products; and mobile-source emissions associated with vehicle trip generation. Regional area- and mobile-source emissions were estimated based on proposed land uses identified in the project description and trip generation rates obtained from the transportation analysis prepared for this project, Section 4.2, Traffic and Circulation (LSA 2007). Project implementation would not include the construction or operation of any major stationary sources of emissions.

The modeled maximum daily operational emissions for winter and summer conditions are summarized in Table 4.3-4 and described in more detail below and in Appendix C.

Table 4.3-4
Summary of Modeled Maximum Daily Long-term Operational (Regional) Emissions

Source	ROG (lb/day	NO_X (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day) [1]	CO (lb/day)
Area Sources(Natural Gas and Consumer Product Usage, Landscaping, and Application of Architectural Coatings) [2]	12.9	2.3	-	-	8.9
Mobile Sources	13.6	17.6	25.3	4.9	156
Total Unmitigated Emissions	26.6	19.9	25.3	4.9	164.9
PCAPCD Significance Threshold	82	82	82	N/A	550
Exceed Threshold?	No	No	No	-	No

[1] $PM_{2.5}$ is a subset of PM_{10}. PCAPCD does not have an adopted threshold for $PM_{2.5}$; however, because the project area is designated nonattainment for $PM_{2.5}$, emissions were provided for informational purposes.
[2] It is assumed that the proposed residential units would be equipped only with natural gas fireplace hearth options.
Emissions were modeled using URBEMIS 2007 (v9.4.2), based on trip generation rates obtained from the transportation analysis prepared for this project, proposed land uses and phasing information identified in the project description, and default model settings.
Refer to Appendix C for detailed assumptions and modeling output files.
Source: Data modeled by EDAW 2009.

Based on the modeling conducted, project operations would result in worst-case maximum unmitigated daily emissions of approximately 27 lb/day of ROG, 20 lb/day of NO_X, 25 lb/day of PM_{10}, and 165 lb/day of CO. Daily unmitigated operational emissions would not exceed PCAPCD's significance thresholds of 82 lb/day for ROG, NO_X, and PM_{10}, or 550 lb/day for CO during both the winter and summer periods. The impact is considered **less than significant**.

Mitigation Measure 4.3-2: Long-Term Operational (Regional) Criteria Air Pollutant and Precursor Emissions.

No mitigation is necessary.

IMPACT 4.3-3 **Exposure of Sensitive Receptors to Substantial Pollutant Concentrations.** *Given the project's location relative to I-80, implementation of the project would expose sensitive receptors to mobile source air pollutant concentrations - specifically TACs - associated with I-80. This impact is considered* ***significant****.*

The exposure of sensitive receptors to emissions of TAC can occur during both the construction and operational phases of the project. Health-related impacts associated with short-term construction and long-term stationary and mobile source operational emissions are discussed separately, as follows:

Short-Term Construction

Construction of the project and associated infrastructure would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Diesel PM was identified as a TAC by the ARB in 1998. Construction of the project would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities.

The dose 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 a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), HRAs should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (Salinas, pers. comm., 2004). Thus, because the use of mobile construction equipment would be temporary, in combination with the dispersive properties of diesel PM (Zhu and Hinds 2002) and the fact that project construction activities would not be atypical in comparison to similar development-type projects (i.e., no excessive material transport or associated truck travel), short-term construction activities would not result in the exposure of sensitive receptors to substantial TAC concentrations. This impact is considered **less than significant**.

Off-site Commercial Land Uses

A HRA was prepared to determine the exposure levels for the future residents within the project that would result from operation of an adjacent approved large-scale commercial project commonly known as "Rocklin Crossings." (Michael Brandman Associates 2007). A HRA requires the completion and interaction of four general steps: 1) quantify project-generated TAC emissions; 2) identify ground-level receptor locations that may be affected by the emissions; 3) perform air dispersion modeling to estimate ambient pollutant concentrations at each receptor location using project TAC emissions and representative meteorological data to define the transport of those emissions in the atmosphere; and, 4) characterize and compare the calculated pollutant concentrations with the applicable health risk significance threshold.

The first step includes identifying and quantifying the TAC emissions sources. The sources of TAC emissions from the Rocklin Crossings project include diesel PM emitted from the delivery truck traffic. Diesel PM from various sources were calculated using forecasted delivery truck information and mobile source emission factors from the CARB EMFAC2007 emissions factor model. Emissions were calculated for delivery vehicle travel and idling time, and included the use of transportation refrigeration units. Travel links were defined and emissions were calculated along each link. Delivery vehicles were assumed to idle for a maximum of 5 minutes per vehicle per day in keeping with existing CARB airborne toxic control measures, which regulate truck idling time.

In order to analyze impacts, a network of receptors must be specified. For this HRA, future residences within the project site were identified as sensitive receptors. TAC emission sources were identified and integrated with meteorological data into the air dispersion model to quantify effects of the TAC emissions generation on these sensitive receptors (project residences).

Based on the modeling results, the highest lifetime excess cancer risk associated with operation of the Rocklin Crossings development project for the residences within the project site would be 5.1 in a million, with the typical cancer risk level being 1 in a million.

These estimated cancer risk levels are conservatively based on a hypothetical individual exposed to carcinogenic emissions from the project site continuously, 24 hours per day, 365 days per year for a 70-year lifetime. The lifetime excess cancer risk associated with operation of the Rocklin Crossings project for the residences within the project would not exceed the PCAPCD cancer risk significance level of 10 in a million. Therefore, this impact would be considered **less than significant**.

Off-site Stationary Sources

The proposed project would not include any on-site stationary sources of TAC emissions. However, neighboring commercial land uses, (e.g., Rocklin Crossings commercial center would be located immediately west of the Rocklin 60 project site) would include diesel fueled emergency backup generators typically associated with commercial land uses. In addition, although exact off-site commercial tenants are not known at this time, possible land uses could include dry cleaners, gas stations, and restaurants using charbroilers.

Pursuant to PCAPCD Rule 511, all sources having the potential to emit TACs are required to obtain permits from the PCAPCD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including Rule 513 (Toxics New Source Review). Such sources are subject to T-BACT and offset requirements. Given that compliance with applicable standards and regulations are required for the development and operation of facilities that may emit TACs, exposure to TAC emissions from stationary sources both on and off the project site are considered to be a **less-than-significant** impact of the proposed project.

Off-site Mobile Sources

Emissions of TACs from freeways and roadways are from *mobile* sources. This is in contrast with *stationary* sources. Examples of stationary sources of TACs include industrial facilities, such as the Sierra Pine facility, which is located approximately one mile to the northwest of the project site. Other stationary sources of TACs could include large back-up emergency diesel-fueled electrical generators associated with large commercial facilities.

For stationary sources of TACs, the PCAPCD and other local air districts use quantitative significance criteria. Significant impacts would occur in cases where cancer risk is more than 10 in one million excess cases or where there is an acute or chronic non-cancer hazard index greater than 1. However, PCAPCD currently does not recommend the *stationary* source standard be applied to *mobile* sources for purposes of determining the significance of an impact in the CEQA context.

As noted previously, in April 2005, ARB published the *Air Quality and Land Use Guidebook: A Community Health Perspective* (the "ARB Handbook"), which provides guidance concerning land use compatibility with sources of TACs (ARB 2005). While not a law or adopted policy, the ARB Handbook offers advisory recommendations for the siting of sensitive receptors near sources of TAC emissions, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities. These recommendations are intended to help keep children and other sensitive receptors out of harm's way.

The ARB Handbook recommends against siting new sensitive land uses within 500 feet of freeways. ARB studied exposures at varying distances from the freeway, with the range of relative cancer risk near the freeway being 1,700 in one million, then declining to 300 in one million at an increased distance from the freeway. The decline in relative cancer risk is not a straight line (i.e., linear relationship), but rather an initial steep curve which levels out as distance increases (i.e., exponential decay). According to the ARB Handbook, the basis for the recommended 500 foot separation distance is that dispersion modeling analyses of some California freeways show a substantial reduction in exposure and risk at 300 feet and about a 70% drop-off in particulate pollution levels at 500 feet. Because the ARB Handbook recommendations are based on high-level, broad-based studies, and individual situations will vary in the actual pollutant exposure rates, the ARB Handbook notes that the land use recommendations are advisory and that local agencies would balance other considerations; including housing and transportation needs, economic development priorities, and other quality of life issues; when locating sensitive receptors near TAC emissions sources.

The proposed project includes the development of 179 single-family residences on a project site that is partially adjacent to I-80. Of the proposed 179 units, 160 units are located more than 500 feet from I-80, with some units located as far as 2,000 feet from I-80. Of the remaining 19 units, the distance between the closest unit and I-80 is approximately 150 feet. I-80 runs diagonally past the northwest corner of the project site. A clear depiction of the lot layout relative to I-80 can be found at Exhibits 3-2 and 3-3 in the Project Description section and at Exhibit 4.12-3 in the Biological Resources section of this EIR (Section 4.12).

At the present time, PCAPCD and ARB have not formally established and adopted significance levels for the assessment of cancer risk from mobile source TACs affecting proposed residential developments near transportation corridors, such as freeways. While the land use guidelines within the ARB Handbook are intended to provide general guidance with respect to siting decisions, the guidelines do not provide significance criteria that can be used within the context of CEQA.

Importantly, the ARB Handbook notes that "Due to the large variability in relative risk between the source categories, we chose not to apply a uniform quantified risk threshold as is typically done in regulatory programs. Therefore, in the end, we tailored our recommendations to minimize the highest exposures for each source category independently. Additionally, because this guidance is not regulatory or binding on local agencies, we took a more qualitative approach to developing distance based recommendations (ARB 2005, page 2)."

Typically, the City would look to the applicable regulatory agency for expert guidance in establishing thresholds of significance for environmental impacts. Lacking formally adopted numerical thresholds and guidelines from ARB and PCAPCD with respect to the establishment of a significance threshold for evaluating mobile source TAC impacts or health risks from mobile sources, the City has used a qualitative approach in establishing a significance threshold, similar to what was done in the ARB Handbook.

Because of the proximity of a few of the proposed residential units to I-80, the applicant retained a consultant to prepare a HRA. This HRA was peer reviewed by EDAW, the City's environmental consultant for this project. The HRA uses various sources of information, including ARB and EPA emission factors, EPA dispersion models, and traffic data from the California Department of Transportation (Caltrans) and the Sacramento Area Council of Governments (SACOG) to quantify potential impacts to the Rocklin 60 project based on the specific facts and circumstances of the proposed project.

The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) has developed HRA guidelines. While the best available science is used in these guidelines, there is inherent uncertainty associated with risk assessment. HRA methodology is designed to over-estimate risk. OEHHA identifies sources of uncertainty including use of toxicity data from animal testing to humans; uncertainty of emissions estimates; uncertainty in air dispersion models; and uncertainty in the exposure estimates. There is also variability in the human population regarding health risk, relating to characteristics such as height, weight, and susceptibility to chemical toxicants (OEHHA 2003). For these reasons and others, risk estimates provided in an HRA report are not the expected rates of disease in the exposed population, but rather estimates of maximum potential risk, based on current knowledge and a number of assumptions. According to OEHHA, "Risk assessment is best used as a ruler to compare one source with another and to prioritize concerns" (OEHHA 2003, page 1-5).

OEHHA recommends 70-year exposure duration for determining cancer risk for residences. OEHHA's guidance document on HRAs also discusses how HRA methodology can be modified to analyze 9- and 30-year exposure periods. These shorter-term exposures are chosen to coincide with EPA's estimates of the average (9 years) and high-end estimates (30 years) of the period people live in one residence. This modified analysis accounts for the reality that most individuals do not live in a home for his or her entire life, but generally live in a home on an average of 9 to 30 years. However, consistent with HRA methodology, this EIR reports the 70-year exposure estimates, and bases impact conclusions on this same "lifetime" exposure period.

The HRA for the Rocklin 60 project showed that the maximum potential cancer risk attributable to diesel particulate matter (DPM) and gasoline exhaust TACs at the proposed lots closest to I-80 would be 174 in one million. The estimated cancer risk would be less for lots at greater distances from I-80. To provide context for the maximum potential cancer risks discussed above, the overall cancer risk in the SVAB attributable to 10 important TACs, including diesel PM, was estimated to be 520 in one million in the year 2000, according to ARB's 2008 California Almanac of Emissions and Air Quality. The 10 selected TACs pose the greatest health risk from all sources in the SVAB based primarily on ambient air quality data. The actual total average SVAB risk would be higher when all TACs are included. Diesel PM poses the greatest health risk among the 10 selected TACs. ARB estimated the cancer risk in the SVAB from diesel PM alone to be 360 in one million. Since 1990, the diesel PM's health risk has been reduced by 52%, and overall, levels of most TACs have gone down since 1990 (ARB 2009a).

It is important to note that when conveying the estimated cancer risk levels identified in the Rocklin 60 HRA (174 in one million), the potential cancer risk attributable to mobile source TAC emissions due to the project's proximity to I-80 should be considered an addition to the potential cancer risk (360 in one million) that is considered to be "background" risk that currently exists in the SVAB. Stated another way, if the Rocklin 60 project was assumed to be currently occupied with residents, those residents would be exposed to a potential cancer risk from DPM of 360 in one million, the "background" risk that currently exists in the SVAB. However, Rocklin 60 residents in the proposed lot closest to I-80 would also be exposed to an additional potential cancer risk from mobile source TACs of 174 in one million due to the project's proximity to I-80. Therefore, the proposed Rocklin 60 project would expose residents to additional health risk above the background condition that exists throughout the SVAB.

The results of the HRA prepared for this project demonstrate that the project's exposure to TACs is not as severe as the very broad and general characterizations of TAC exposure made in the ARB's Handbook (wherein the relative range of cancer risks associated with locating sensitive uses within 500 feet of a freeway is 300 to 1,700 in one million). The reduced risk for the proposed project compared to studies referenced in the ARB Handbook can be attributed to several factors, including local meteorological conditions, the project setting, and improving air quality trends. The actual risk for future residents of Rocklin 60 may also be lower than studies referenced in ARB's Handbook due to residential occupancy characteristics. These factors are further elaborated upon below.

Meteorological Conditions and Project Setting

The prevailing winds in the project area blow from the south and southwest. This situates the proposed project upwind of I-80, and therefore the prevailing wind conditions have a minimizing to neutral effect on freeway-related emissions as experienced at the project site.

Improving Air Quality Trends

As noted in the Regulatory Setting section, mobile-source emissions of TACs have been substantially reduced over the last decade, and will be reduced further in California through a progression of regulatory measures and control technologies. As emissions are reduced, it is expected that risks associated with exposure to emissions will also be reduced. The HRA prepared for proposed project utilized future regulatory measures and control technologies, as discussed above in its modeling, and the HRA results reflect future emission reductions based on implementation of those measures and technologies.

Occupancy Considerations

As noted above, conclusions in the HRA are based upon a 70-year exposure period. However, as also noted above, EPA estimates that the average length for receptors residing in one location is 9 years, and the high-end estimate of residing in one location is 30 years. Given that data, the use of a 70-year exposure period (per OEHHA-recommended methodology) would be expected to provide conservative health risk estimates when compared to the actual anticipated duration of occupancy for most residents of the Rocklin 60 project. It is also important to note that the majority of the population does not spend its entire year, week, or 24-hour day within its residence, and, thus, is not continuously exposed to emissions on a 365 days per year/24 hours per day/7 days per week basis. The maximum potential cancer risk is calculated based on the assumption that an individual is exposed to the outdoor air concentrations computed by the dispersion model for 24 hours per day throughout a 70-year exposure period. In fact, people in general spend more time indoors than outdoors. On average, people have been found to spend an average of 22.5 hours per day indoors. TAC levels indoors are typically one-third lower in residences and schools compared to outdoor levels and almost on-half lower in offices compared to outdoor levels (ARB 2000).

Although the HRA for the Rocklin 60 project concluded that risks from nearby I-80 on proposed residences in the Rocklin 60 project are not as severe as the characterizations presented in the ARB's Handbook, the project still presents a potential health risk. However, the project is not unique in this aspect; as such a potential health risk exists throughout the Sacramento region and elsewhere throughout the state as a result of residential uses being located in proximity to freeways. While it is not possible to predict the number or severity of illnesses that could be attributable to the project itself, the project would expose sensitive receptors to pollutant concentrations to the extent that health impacts could potentially result. Since no definitive quantitative mathematical model has been adopted to describe this impact, the City has examined the available information on the topic, and can make a qualitative analysis of generalized risk information presented in the ARB's Handbook and the site-specific information presented in the HRA for the project.

Conclusion

It is acknowledged that the placement of the proposed residences in proximity to I-80 would result in exposure to increased pollutant concentrations, but the question of whether the increased exposure can be categorized as substantial remains. As noted above, freeway studies have shown that a substantial reduction in exposure and health risk occurs at 300 feet from the freeway and about a 70% drop off in particulate pollution levels occurs at 500 feet from the freeway. Because the majority (160 of 179) of the proposed units in the Rocklin 60 project would be located at a distance greater than 500 feet from I-80, and because of the 19 units located within 500 feet from I-80, 14 are located between 300 and 500 feet from I-80 (the distance at which a substantial reduction in exposure and health risk occurs), a determination of whether or not the Rocklin 60 project would result in a substantial exposure cannot be made. However due to site-specific characteristics, the exposure and associated health risk at the Rocklin 60 subdivision would be near the exposure levels that ARB has recommended are unacceptable. Therefore, there is insufficient information to make a finding that the project would result in a less-than-significant impact without mitigation. Therefore, this impact is considered to be **potentially significant.**

A mitigation method presented in a study done at the University of California Davis to reduce the impact of freeway generated TACs is a specific combination of tiered fine-needle tree planting along the project's freeway frontage. The impact of fine-needle trees is not fully understood, but the study documented beneficial results in exposure (i.e., reduction in TAC levels) from their use (Fujii, et al, 2008)[1]. As such, the City has determined that eliminating the lot closest to the freeway and using that lot as a tree planting mitigation area is a feasible

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[1] Fujii, Erin, Jonathan Lawton, Thomas A. Cahill, David E. Barnes, Chui Hayes and Nick Spada. *Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size*, draft final report to the Breathe California of Sacramento, Emigrant Trails Health Effects Task Force and Sacramento Metropolitan Air Quality Management District, February 24, 2008.

mitigation measure, and, based on current knowledge, is a prudent step to take as part of this project to reduce potential impacts.

To reduce the potentially significant impact to a less-than-significant level, mitigation is required. This mitigation measure is based on recent research conducted by the Delta Group at the University of California Davis (Fujii, et al, 2008)[2] and by EPA[3]. The fundamental principle is that air pollutants, especially particulate matter (e.g., diesel PM from mobile sources), can be removed on the surfaces of vegetation, especially that of the needles on coniferous trees, and also on the leaves of deciduous trees. The amount of removal depends on the wind speed, wind direction, the type of tree, and the physical arrangement and quantity of trees placed between the emission source (e.g., roadway) and the project's receptors. Precise quantitative information on the beneficial effect of each of these variables is not available in a framework that would allow a determinative calculation of the reduction in potential impacts. However, conservative design of the mitigation measure is proposed in a manner that can be expected to effectively reduce the level of significance of this potential impact.

Mitigation Measure 4.3-3, Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

The research documented a reduction in penetration of particulate similar to freeway-generated mobile-source diesel PM through fine-needle tree branches. Therefore, the City has determined that eliminating construction of a residence on Lot 155; the lot closest to the freeway; and using that lot as a tree planting mitigation area, is a feasible mitigation measure. The data available indicate that planting fine-needle evergreen trees on Lot 155 would both enhance the dispersion of emissions from the freeway, and intercept particulate pollutants, including mobile-source diesel PM. To implement this mitigation measure, tiered-tree planting (multiple rows) of a variety of drought-tolerant, fine-needle evergreen trees such as, but not limited to, deodar cedar and redwood, shall be planted (at a minimum size of 15 gallon per tree) within Lot 155 of the project site. In addition, provisions shall be made for a sufficient water supply and necessary site maintenance to ensure establishment and long-term viability of the trees. The trees shall be planted at a density such that a solid visual barrier is achieved once the trees reach maturity, which breaks the line-of-sight between the freeway and the proposed homes.

Level of Significance after Mitigation

The above-described mitigation would reduce the potential exposure of the affected portion of the Rocklin 60 project to freeway-related TACs such that freeway emissions would be dispersed and intercepted. Although the efficacy of such mitigation efforts is not currently quantifiable, it is understood that such efforts would reduce the level of exposure of the affected residents of the Rocklin 60 project. The City has, therefore, concluded that the mobile-source TAC concentrations would no longer be considered substantial, and hence, would be less than significant after mitigation.[4,5]

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[2] Fujii, Erin, Jonathan Lawton, Thomas A. Cahill, David E. Barnes, Chui Hayes and Nick Spada. *Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size*, draft final report to the Breathe California of Sacramento, Emigrant Trails Health Effects Task Force and Sacramento Metropolitan Air Quality Management District, February 24, 2008.

[3] Baldauf, R., E. Thoma, A. Khlystov, V. Isakov, G. Bowker, T. Long and R. Snow. *Impacts of noise barriers on near-road air quality,* Atmospheric Environment 42, 7502-7507, 2008.

[4] A significant effect on the environment means a substantial, or potentially substantial, change in the environment caused directly or indirectly by the project (ARB. *Preliminary Draft Staff Proposal – Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act,* released October 24, 2008.

[5] California Code of Regulations, Title 14, Section 15064, subd. (d), 15382.

IMPACT 4.3-4 **Long-Term Operational (Local) Mobile-Source Carbon Monoxide Emissions.** *Because the proposed project is not anticipated to result in or contribute to local CO concentrations that exceed the California 1-hour or 8-hour ambient air quality standards of 20 ppm or 9 ppm, respectively, this impact is considered* ***less than significant****.*

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions); 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, and hospitals. As a result, the PCAPCD also recommends analysis of CO emissions at a local level.

The Transportation Project-Level Carbon Monoxide Protocol (Garza et al. 1997) states that signalized intersections which operate at an unacceptable level of service (LOS) represent a potential for a CO violation, also known as a "hot spot." Thus, an analysis of CO concentrations is typically recommended for receptors located near signalized intersections that are projected to operate at LOS E or F.

According to the traffic analysis prepared for this project, most signalized intersections in the vicinity of the project site under existing plus project conditions would operate at LOS D or better during the PM peak hour with the recommended traffic improvements in place (LSA 2007). The intersection of Taylor Road and Horseshoe Bar Road would operate at unacceptable LOS with and without the project. The level of service during the afternoon peak hour is estimated to be F. The project would increase the volume to capacity ratio of this intersection from 1.008 to 1.010. For more information, please refer to Section 4.2 of this EIR (Traffic and Circulation). Because LOS F is estimated for an intersection that would handle a minor amount of project traffic, a screening level analysis was conducted for CO concentrations, as described below.

Local mobile-source CO concentrations were assessed using a screening level procedure provided by SMAQMD, which are applicable to the project area (SMAQMD 2004). This screening level analysis conservatively estimates the background CO concentration in the project area and the project-generated pollutant concentration to anticipate the combined concentration level. Based on this analysis, the 1- and 8-hour background CO concentrations for the year 2010 were calculated to be 2.64 ppm and 1.32 ppm, respectively. The year 2010 was selected for analysis based on the assumption that the project could be built out by this time. Project-generated 1- and 8-hour CO emissions from peak-hour daily trips were calculated to be 0.7 ppm and 0.49 ppm, respectively, which results in total (existing plus project) concentrations of 3.34 ppm and 1.81 ppm. Thus, the proposed project is not anticipated to result in or contribute to local CO concentrations that exceed the California 1-hour or 8-hour ambient air quality standards of 20 ppm or 9 ppm, respectively. As a result, the impact of long-term operational emissions of local CO associated with the proposed project would be considered **less than significant**. No mitigation is required.

Mitigation Measure 4.3-4: Long-Term Operational (Local) Mobile-Source Carbon Monoxide Emissions.

No mitigation is necessary.

IMPACT 4.3-5 **Creation of, or Exposure to Odorous Emissions.** *Because the proposed project would not create objectionable odors affecting a substantial number of people or expose sensitive receptors to objectionable odors, this impact is considered* ***less than significant****.*

The occurrence and severity of odor impacts depends on numerous factors, including: the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and regulatory agencies.

The construction of the proposed project would result in diesel exhaust emissions from on-site construction equipment. The diesel exhaust emissions would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. In addition, the project is not anticipated to result in the installation of any major odor emission sources (e.g., food processing plant, landfill, wastewater treatment facility) that would result in a potentially significant impact to the occupants of the proposed or existing off-site land uses. Residential land uses are not typically considered sources of odor. The project would not create odors that would affect a substantial number of people. The impact is **less than significant**.

Although proposed receptors would be sited near adjacent commercial uses, which have not yet been identified, such commercial uses are considered to be minor sources of odors. Such sources typically include dry cleaning establishments, restaurants, and gasoline stations. Fast food restaurants have the potential for the generation of odors from the operation of charbroilers and deep fat fryers. In addition, on-site trash receptacles used by the new commercial land uses have the potential to create odors. The proposed project would be located in the general vicinity of such sources and may be exposed on a frequent basis to odors.

Increases in odor complaints could potentially occur, primarily because of increased development within the area combined with development of minor odor sources within the area (e.g., dry cleaning establishments, restaurants, gasoline stations). While there is a potential for odors to occur, compliance with industry standard odor control practices and PCAPCD Rule 205 (Nuisance) would limit potential odor impacts. In addition, it is anticipated that any product of retail operations that has the potential to emit odors would be packaged in sealed containers and/or handled in a manner that would not emit any objectionable odors. Consequently, the project would not expose sensitive receptors to substantial objectionable odors. This impact would be **less than significant**. No mitigation is required.

Mitigation Measure 4.3-5: Creation of, or Exposure to Odorous Emissions.

No mitigation is necessary.