3.2 AIR QUALITY

3.2.1 AFFECTED ENVIRONMENT

The SPA is located in the city of Rancho Cordova, in Sacramento County, California, in an area under the jurisdiction of the Sacramento Metropolitan Air Quality Management District (SMAQMD). SMAQMD operates at the local level with primary responsibility for attaining and maintaining the Federal and state ambient air quality standards in Sacramento County.

Sacramento County is within the Sacramento Valley Air Basin (SVAB), which also includes all of Butte, Colusa, Glenn, Shasta, Sutter, Tehama, Yolo, and Yuba Counties, the western portion of Placer County, and the eastern portion of Solano County. Air quality in the SVAB is also regulated at the Federal level by the U.S. Environmental Protection Agency (EPA) and the state level by the California Air Resources Board (ARB). Each of these agencies develops rules, regulations, and policies to comply with applicable legislation. Although EPA regulations may not be superseded, both state, regional, and local regulations may be more stringent. Applicable regulations associated with criteria air pollutant, toxic air contaminant (TAC), and odor emissions are described in the following sections.

Ambient concentrations of air pollutants (including odors and greenhouse gases, or GHGs) are determined by the qualities and quantities of emissions released by sources and the atmosphere's ability to transport, dilute, and transform the emissions. Natural factors that affect transport, dilution, and transformation include terrain, wind, atmospheric stability, and sunlight. The combination of low wind speeds and restricted vertical mixing generally produces the highest concentrations of air pollutants. Therefore, existing air quality conditions in an area are determined by natural factors, such as topography, meteorology, and climate, in addition to the sources and strengths of emissions, as discussed separately below.

TOPOGRAPHY, CLIMATE, AND METEOROLOGY

The SVAB is relatively flat, bordered by mountains to the east, west, and north. 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 (Delta), bringing with it pollutants from the heavily populated San Francisco Bay Area. The climate is characterized by hot, dry summers and cool, rainy winters.

Periods of dense and persistent low-level fog that are most prevalent between storms are characteristic of SVAB winter weather. The average winter temperature is a moderate 49 degrees Fahrenheit (°F). Most precipitation in the area results from air masses that move in from the Pacific Ocean from the west or northwest during the winter rainy season (November–April). 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.

Regional and localized meteorological conditions, such as wind flow patterns, disperse pollutants and reduce pollutant concentrations. An inversion layer develops when a layer of warm air traps cooler air close to the ground. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in the air. The surface concentrations of pollutants are highest when these conditions are combined with strong ground-level sources (SMAQMD 2009:1-7–1-8).

The ozone season (May–October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the Delta sea breeze arriving in the afternoon from the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the "Schultz Eddy" prevents this from occurring. Instead of

allowing for the prevailing wind patterns to move north carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern and pollutants to circle back southward. This phenomenon's effect exacerbates the pollution levels in the area and increases the likelihood of violating the Federal and state air quality standards (SMAQMD 2009:1-7–1-8).

The local meteorology of the project area (SPA and vicinity) is represented by measurements recorded at the Sacramento 5 ESE station, near California State University (CSU), Sacramento. The normal annual precipitation, which occurs primarily from November through April, is approximately 18 inches (Western Regional Climate Center [WRCC] 2010a). January temperatures range from an average minimum of 40°F to an average maximum of 53°F. July temperatures range from an average minimum of 59°F to an average maximum of 92°F (WRCC 2010a). The predominant wind direction and speed is from the south-southwest at approximately 8 mph (WRCC 2010b; National Climatic Data Center [NCDC] 2010).

EXISTING AIR QUALITY—CRITERIA AIR POLLUTANTS

California and National Ambient Air Quality Standards

ARB and EPA currently focus on the following air pollutants as indicators of ambient air quality: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. 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."

EPA has established primary and secondary national ambient air quality standards (NAAQS) for the following criteria air pollutants (CAPs): ozone, CO, NO_2, SO_2, respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect public welfare. In addition to the NAAQS, ARB has established California ambient air quality standards (CAAQS) for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, in addition to the above-mentioned CAPs. 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 an additional margin of safety to protect sensitive receptors, particularly children and infants (ARB 2010a). The NAAQS and CAAQS as discussed above are listed in Table 3.2-1, and health effects are described in Table 3.2-2.

California and National Area Designations

Both ARB and EPA use ambient air quality monitoring data to designate areas according to their attainment status for CAPs. The purpose of these designations is to identify the areas with air quality problems and initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. An "attainment" designation for an area signifies that pollutant concentrations did not exceed the established standard. In most cases, areas designated or redesignated as attainment must develop and implement maintenance plans which are designed to assure continued compliance with the standard (SMAQMD 2009:1-2).

In contrast to attainment, a "nonattainment" designation indicates that a pollutant concentration has exceeded the established standard. Nonattainment may differ in severity. To identify the severity of the problem and the extent of planning and actions required to meet the standard, nonattainment areas are assigned a classification that is commensurate with the severity of their air quality problem (e.g., moderate, serious, severe, extreme).

Finally, an unclassified designation indicates that there is insufficient data for determining attainment or nonattainment (SMAQMD 2009:1-2). In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment.

Table 3.2-1
Summary of Ambient Air Quality Standards and Attainment Designations

Pollutant	Averaging Time	California		National Standards[1]		
		Standards[2,3]	Attainment Status (Sacramento County)[4]	Primary[3,5]	Secondary[3,6]	Attainment Status (Sacramento County)[7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Serious)	–	–	–
	8-hour	0.070 ppm (137 µg/m^3)	N	0.075 ppm (147 µg/m^3)	Same as Primary Standard	N (Severe)
Carbon monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A (Maintenance Status)
	8-hour	9.0 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 (339 µg/m^3)	A	0.100 ppm	–	–
Respirable particulate matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	–	Same as Primary Standard	N (Moderate)
	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
	24-hour	No Separate State Standard		35 µg/m^3		

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter

[1] National standards (other than ozone, particulate matter, and those standards based on annual averages or annual arithmetic mean) 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 the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1 day. For $PM_{2.5}$, the 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 U.S. Environmental Protection Agency for further clarification and current Federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), NO_2, and particulate matter are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[3] Concentrations are expressed first in units in which they were issued (i.e., ppm or µg/m^3). Equivalent units given in parentheses are based on 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): The data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): The state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): There was at least one violation of a state standard for that pollutant in the area.

[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.

Sources: ARB 2010a, 2010b; EPA 2010a.

Table 3.2-2
Health Effects of Criteria Air Pollutants

Pollutant	Acute[1] Health Effects			Chronic[2] Health Effects		
	Concentration	Averaging Time	Symptoms	Concentration	Averaging Time	Symptoms
Ozone	0.10 ppm–0.40 ppm	1-2 hours	increased respiration and pulmonary resistance; cough, pain, shortness of breath	–	long/lifetime	permeability of respiratory epithelia, possibility of permanent lung impairment
	<= 0.12 ppm	hours	lung inflammation			
Carbon monoxide (CO)	70 ppm–400 ppm	< 3 hours	headache, dizziness, fatigue, nausea, vomiting	–	after acute exposure not resulting in death	permanent heart and brain damage
	> 800 ppm	2-3 hours	death			
Nitrogen dioxide (NO_2)	10-20 ppm	short	coughing, difficulty breathing, vomiting, headache, eye irritation	–	severe intoxication after acute exposure	chronic bronchitis, decreased lung function
	–	4–12 hours	chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat			
	> 150 ppm	hours	death			
Respirable particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$)	dependent on particle size, composition, number	–	breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	dependent on particle size, composition, number	long/lifetime	alterations to the immune system, carcinogenesis

Notes: ppm = parts per million

[1] "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.

[2] "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.

Sources: Godish 2004, New Hampshire Department of Environmental Services [NHDES] 2007, U.S. Office of Technology Assessment [USOTA] 1989, EPA 2010b, 2010c

Sacramento County is designated nonattainment for the state and Federal ozone, PM_{10} and $PM_{2.5}$ standards. However, air quality monitoring data shows that Sacramento County does meet the Federal PM_{10} standard. Because the entire state is in attainment for SO_2 and most of the state is in attainment for lead (except for one area of Los Angeles County), SO_2 and lead will not be discussed further.

Criteria air pollutant concentrations are measured at 13 monitoring stations in Sacramento County. The Sloughhouse station is the closest monitoring station to the SPA with recent data for ozone. PM_{10} data were not available at the Sloughhouse station, and therefore were obtained from the Branch Center Road #2 station in Sacramento, which is the next closest monitoring station to the SPA. CO, NO_2, and $PM_{2.5}$ data were obtained from the Del Paso Manor station. In general, the ambient air quality measurements from these monitoring stations are representative of the air quality in the vicinity of the SPA. Table 3.2-3 summarizes the air quality data from the most recent 3 years for these monitoring stations.

Table 3.2-3
Summary of Annual Ambient Air Quality Data (2007–2009)

	2007	2008	2009
Ozone[a]			
Maximum concentration (1-hour/8-hour average, ppm)[b]	0.097/0.089	0.148/0.108	0.122/0.099
Number of days state 1-hour standard exceeded	2	16	11
Number of days state/national 8-hour standard exceeded	17/10	37/19	34/24
Nitrogen Dioxide (NO_2)[c]			
Maximum concentration (1-hour, ppm)	0.051	0.058	0.049
Annual arithmetic mean concentration (ppm)	0.011	0.011	0.010
Number of days state 1-hour standard exceeded	0	0	0
Carbon Monoxide (CO)[c]			
Maximum concentration (1-hour/8-hour average, ppm)[b]	3.5/2.9	2.9/2.49	3.1/2.77
Number of days state standard exceeded	0	0	0
Number of days national standard exceeded	0	0	0
Fine Particulate Matter ($PM_{2.5}$)[c]			
State annual average design value exceeded	yes	yes	yes
National annual average design value exceeded	yes	yes	yes
Estimated number of days national 24-hour standard exceeded	26.1	24.1	8.9
Respirable Particulate Matter (PM_{10})[d]			
Maximum 24-hour average concentration ($\mu g/m^3$)[b]	60.0	89.0	76.0
Estimated number of days state 24-hour standard exceeded	30.2	68.7	12.2
Estimated number of days national 24-hour standard exceeded	0	0	0

Notes: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter

[a] Ozone data were obtained from the Sloughhouse monitoring station in Sacramento, which is the closest monitoring station to the SPA.

[b] The 1-hour maximum concentrations are measured values; all other reported averages are based on state methods.

[c] Data from the Del Paso Manor station were utilized for NO_2, CO, and $PM_{2.5}$.

[d] Data from the Branch Center Road #2 station were used for PM_{10}, the second closest monitoring station to the SPA.

Sources: ARB 2009c, 2009d; EPA 2009b

Criteria Air Pollutants

Ozone

Ozone is a photochemical oxidant, a highly reactive gas, and even at low concentrations it is irritating and toxic. Ozone is the primary component of smog and is not emitted directly into the air, but formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. ROG are volatile organic compounds (VOCs) that are emitted from natural sources (such as plants), incomplete fossil fuel combustion, and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels. ROG and NO_X are not themselves CAPs (with the exception of NO_2), but are controlled through Federal, state, regional, and local regulations, programs, and rules to limit ozone formation.

Ozone located in the upper atmosphere (stratosphere) shields 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. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds and stagnant air coupled with warm temperatures and sunlight 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 downwind of the precursor emissions, making ozone a regional pollutant that can affect 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 (ARB 2009a:1-19; Godish 2004:51–55).

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 also healthy adults. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 part per million (ppm) for 1 or 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, which can inhibit the immune system's ability to defend against infection (Godish 2004:159–161).

In 1997, EPA promulgated a new 8-hour standard in recognition of impacts resulting from daylong exposure. On April 15, 2004, EPA designated areas of the country that exceed the 8-hour standard ozone standard as nonattainment. The designations were in place as of February 2009. These designations have triggered new planning requirements for the 8-hour standard.

Because it does not meet the air quality standards for ozone, Sacramento County, as part of the larger Sacramento Federal Ozone Nonattainment Area (SFNA), is designated a "severe" nonattainment area for the Federal eight hour ozone standard, and is designated a "serious" nonattainment area for the state one hour ozone standard.

Trends

On-road motor vehicles and other mobile sources are by far the largest contributors to NO_X emissions in the SVAB. According to the 2008 emissions inventory for Sacramento County, approximately 58% of NO_X emissions in Sacramento County are generated by on-road motor vehicles; an additional 33% of NO_X emissions are generated by other mobile sources, most notably off-road vehicles (ARB 2009b). More stringent mobile source emission standards and cleaner burning fuels have largely contributed to a decline in NO_X emissions in the past 30 years (ARB 2009a:A-36). On-road motor vehicles contributed 37% of the ROG emissions in Sacramento County in 2008, with other mobile sources contributing an additional 33% (ARB 2009b). ROG emissions have been decreasing significantly for the last 30 years because of more stringent motor vehicle standards and new rules for control of ROG from various industrial coating and solvent operations (ARB 2009a:A-36). Even so, the

ozone problem in the SVAB ranks among the most severe in the state. Peak ozone values in the SVAB have not declined as quickly over the last several years as they have in other urban areas. The peak 8-hour indicator remained fairly constant from 1988 to 2007 (ARB 2009a:A-92). Since the early 1990s, the peak 8-hour indicator has decreased slightly, and the overall decline for the 20-year period is on the order of 10%. Looking at the number of days above the state and national standards, the trend is much more variable. The numbers of exceedance days have not declined significantly since the early 1990s (ARB 2009a:A-92).

Nitrogen Dioxide

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 oxidizes in the atmosphere to form NO_2 (EPA 2010b). 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. In California, NO_X is primarily emitted by mobile sources, which account for 86% of the total state NO_X emissions (ARB 2009a:2-4).

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 (Office of Environmental Health Hazard Assessment [OEHHA], 2008:209-216). After a period of approximately 4–12 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 (OEHHA 2008:209-216).

Sacramento County is in attainment for NO_2.

Trends

As described previously, mobile sources are by far the largest contributors to NO_X emissions in Sacramento County, accounting for 91% of the total (ARB 2009b). More stringent mobile source emission standards and cleaner burning fuels have largely contributed to a decline in NO_X emissions (ARB 2009a:4-57, A-36). Maximum one-hour concentrations of NO_2 in Sacramento County have been variable, without significant decline, since the early 1990s; however, maximum annual averages have dropped by about 25% in the past decade.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas produced by incomplete combustion of carbon in fuels, primarily from mobile (transportation) sources, which comprised 80% of the statewide CO emissions in 2008. The remaining 20% of CO is emitted primarily from wood-burning stoves, managed burning, and incineration (ARB 2009a:2-4–2-11).

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 include dizziness, headaches, fatigue, and at higher concentrations, death (EPA 2010b, NHDES 2007). CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA 2010c:171).

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

Sacramento County is in attainment for CO and is currently in a "maintenance status."

Trends

On-road motor vehicles and other mobile sources are by far the largest contributors to CO emissions. Emissions of CO in Sacramento County have declined by almost a factor of five since 1990 (ARB 2009a:A-36). No violations of the state or Federal 8-hour CO standards have occurred since 1993.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 microns or less is referred to as PM_{10}. The major fraction of PM_{10} by mass consists of coarse particulate matter emitted directly into the air, such as mechanically-generated dust, soot, and smoke from mobile sources, stationary sources, and fires. $PM_{2.5}$ is subgroup of PM_{10}, composed of finer particles that have an aerodynamic diameter of 2.5 microns or less, generally formed by secondary processes, such as condensation of combustion gases or transformation of ambient SO_2, NO_X, and ROG (EPA 2010b).

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, adverse health effects may be associated with adsorption of metals, polycyclic aromatic hydrocarbons, and other toxic substances onto fine PM ("piggybacking"), 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 2010b). Fine particulate matter ($PM_{2.5}$) poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

Sacramento County is currently designated as nonattainment for the state and Federal $PM_{2.5}$ and PM_{10} standards.

Trends

The largest sources of $PM_{2.5}$ and PM_{10} in Sacramento County are areawide sources, such as residential fuel combustion, construction and demolition, and road dust, which account for 73% of $PM_{2.5}$ emissions and 89% of PM_{10} emissions (ARB 2009b).

Direct emissions of PM_{10} have been increasing in Sacramento County in the past 30 years, primarily from areawide sources such as paved road dust, which increases proportionally with vehicle miles traveled, or VMT. The population and subsequent VMT growth rates in the SVAB are larger than statewide population and VMT growth rates during the 1980-2020 timeframe (ARB 2010a:4-57). Direct emissions of $PM_{2.5}$ have been fairly stable over the same time period. Statewide programs aimed at reducing ozone and diesel PM (DPM) will also help to reduce public exposure to $PM_{2.5}$.

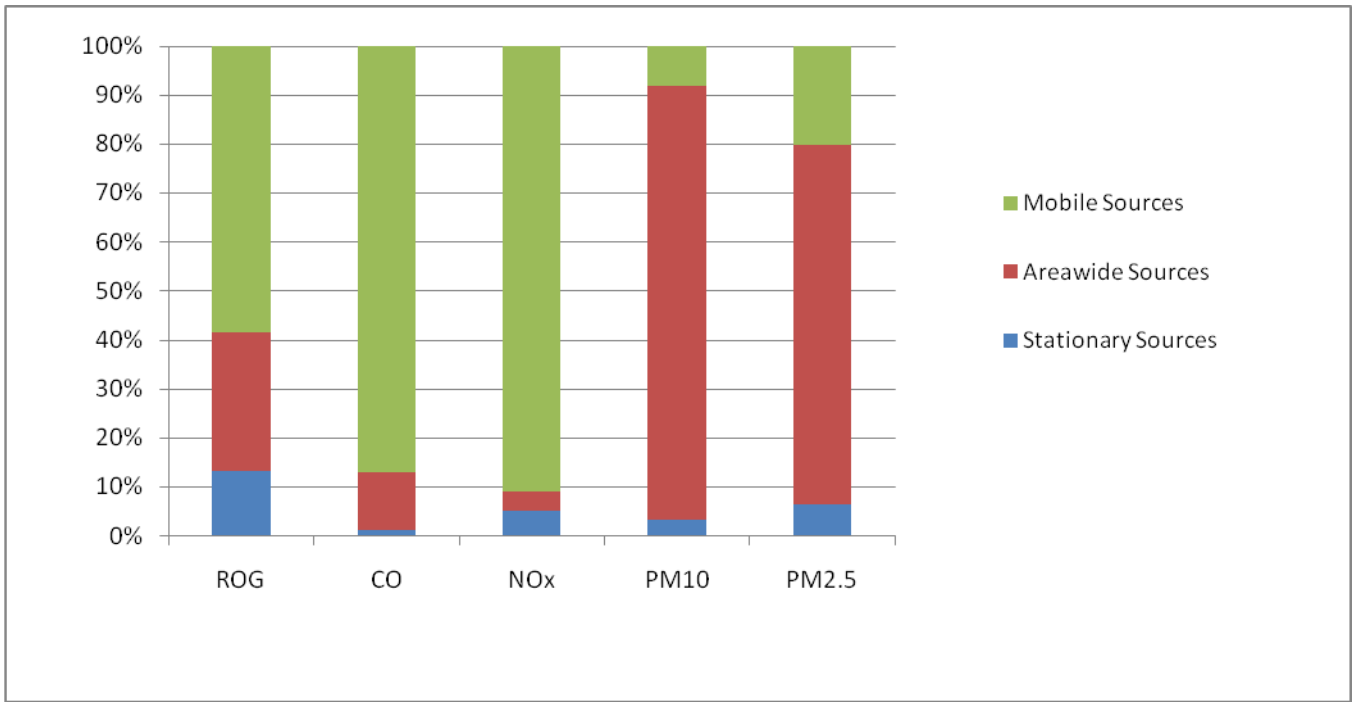
State and national maximum 24-hour concentrations of PM_{10} have been variable in Sacramento County for the past decade, with no discernible downward trends. National and state annual average concentrations of PM_{10} have been fairly stable over the same period of time. The number of violations of the state 24-hour standard have been variable over the past 15 years, with no decreasing trend, and there have been no violations of the national 24-hr standards since before 1989 (ARB 2009a:A-92).

State maximum 24-hour $PM_{2.5}$ concentrations have been decreasing in Sacramento County in the past decade, while national maximum 24-hour $PM_{2.5}$ concentrations have been more variable. State and national $PM_{2.5}$ averages have been fairly constant for the past decade (ARB 2009a:A-92).

Emission Sources

Sources of CAPs in Sacramento County and the SPA include stationary, area, and mobile sources. According to the 2008 emissions inventory for Sacramento County, the majority of NO_X emissions are attributable to mobile sources; stationary and areawide sources are the greatest contributors of organic gases (ozone precursors from landfills, farming, and managed burning), while areawide and mobile sources are the greatest contributors of CO (managed burning and vehicular traffic), and PM (road dust and managed burning) (ARB 2009b).

Exhibit 3.2-1 summarizes emissions of criteria air pollutants and precursors within Sacramento County for various source categories.



Notes: ROG = reactive organic gases; CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter.

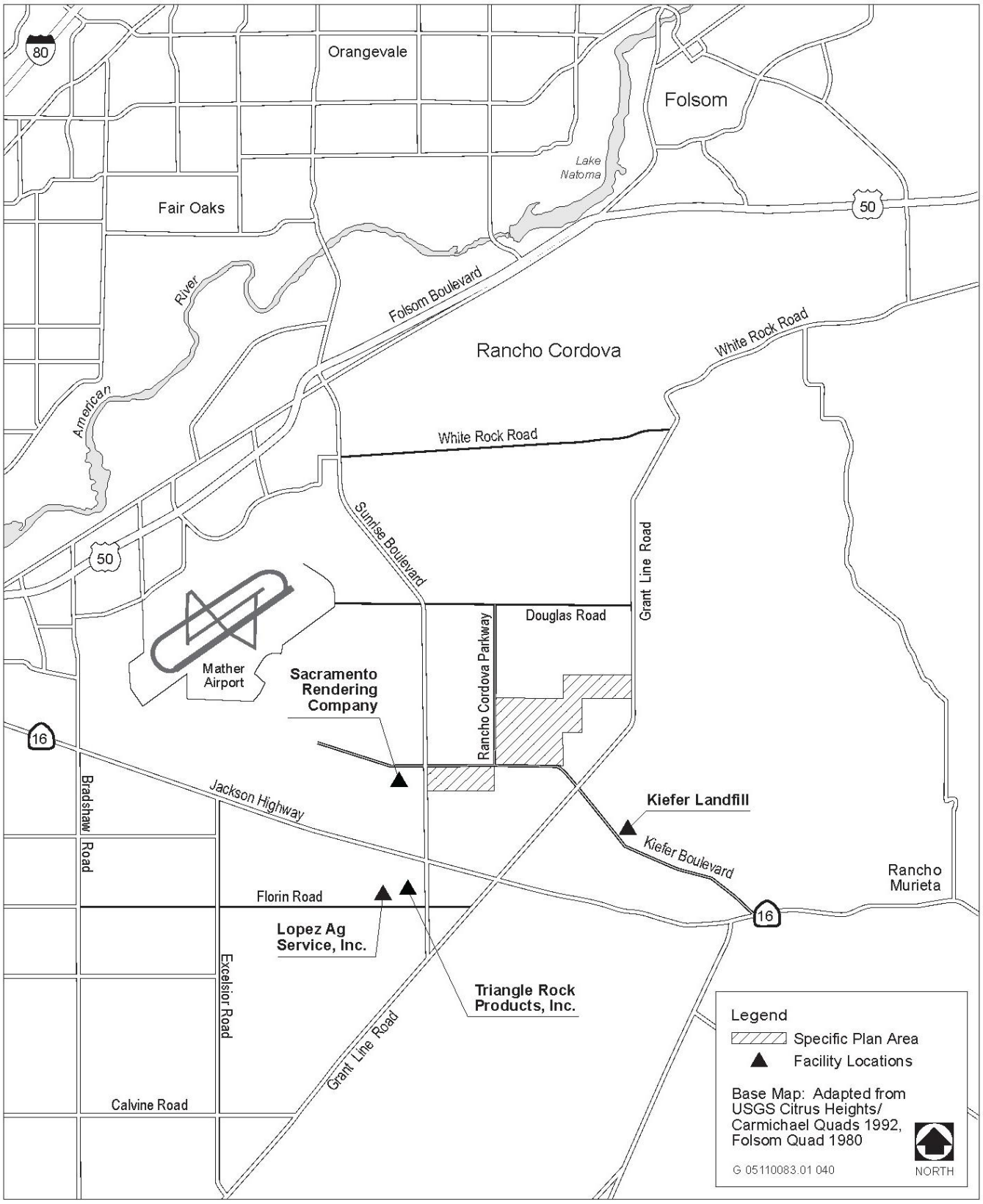
Source: ARB 2009b

Summary of 2008 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors (Sacramento County, Tons/Day) **Exhibit 3.2-1**

Stationary Sources

Most stationary sources of CAP emissions within the City and County of Sacramento are minor sources, and include hospitals, small electrical producers and cogeneration facilities, and light commercial and industrial processes (i.e., asphalt mixing, sand and gravel production, brick and tile manufacturing, fiberglass manufacturing, food processing with and without cogeneration) (ARB 2010e, 2010f). There are no major stationary sources of CAPs near the SPA (see Exhibit 3.2-2).

Kiefer Landfill is within 2 miles of the SPA, to the southeast, (see Exhibit 3.2-2), and is the largest source of organic gas (mainly methane, a GHG) in Sacramento County; it is a small source of other criteria pollutants (ARB 2009a, 2010e, 2010f).



Source: ARB 2010e

CAPs, TACs, Odors, and Sensitive Receptors Near the SPA **Exhibit 3.2-2**

Areawide Sources

Areawide sources of emissions in Sacramento County include solvent evaporation from consumer products and application of architectural coatings, residential fuel combustion, construction and demolition, road dust, managed burning, farming, and other miscellaneous sources. Solvent evaporation is the largest contributor to ROG emissions; residential fuel combustion is the largest contributor to CO and NO_X emissions; and construction/ demolition and road dust are largest contributors to PM emissions in the county (ARB 2009b).

Mobile Sources

On-road and other mobile sources are the largest contributors of ROG, CO, and NO_X within Sacramento County. On-road sources consist of passenger vehicles, trucks, buses, and motorcycles, while off-road vehicles and other mobile sources are comprised of heavy-duty equipment, boats, aircraft, trains, recreational vehicles, and farm equipment.

Major roadways near the SPA include Sunrise Boulevard, Douglas Road, Grant Line Road, and Jackson Highway (State Route [SR 16]), with traffic volumes approaching 30,000 vehicles per day at the intersections of Sunrise Boulevard/Douglas Road to Kiefer Boulevard and Sunrise Boulevard/Kiefer Boulevard to SR 16 (Fehr & Peers 2010).

EXISTING AIR QUALITY—TOXIC AIR CONTAMINANTS

TACs are air pollutants that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at low concentrations. According to *The California Almanac of Emissions and Air Quality* (ARB 2009: 1-9, 1-12), 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 (DPM, a subset of PM_{10} emissions). DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although DPM 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 DPM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies on chemical speciation to estimate concentrations of DPM.

Of the TACs for which data are available in California, DPM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risks (ARB 2009a:5-2–5-5). DPM poses the greatest health risk among these 10 TACs. Health risks associated with DPM are expected to drop by the year 2020 due to implementation of ARB's heavy duty vehicle regulations and Diesel Risk Reduction Plan (ARB 2009a:5-42–5-44).

DPM emissions are estimated to be 2,590 tons/year in the SVAB, which constitutes approximately 7% of the DPM emissions in the state (ARB 2009a:5-82). Based on receptor modeling techniques, ARB estimated health risks from DPM exposure to be 360 excess cancer cases per million people in the SVAB in the year 2000 (ARB 2009a:5-83). Since 1990, the health risk associated with DPM has been reduced by 52% in the SVAB. Overall, levels of most TACs, except for *para*-dichlorobenzene and formaldehyde, have decreased since 1990 in the SVAB (ARB 2009a:5-83–5-84).

Several stationary sources of TACs exist in the city and county of Sacramento, including manufacturers of foods, chemicals, building products, and fabrics; hospitals; crematoriums; quarries; and petroleum storage and terminals (ARB 2010f).

SMAQMD recommends a discussion of whether the project would locate new receptors in close proximity to an existing or future planned source of TAC emissions (SMAQMD 2009:5-3). The only stationary sources of TACs in the vicinity of the SPA are the Kiefer Landfill (described below in the "Existing Air Quality—Odors" section), and Triangle Rock Products, Inc., a construction sand and gravel company, which reported about 16,000 pounds per year (lbs/year) of crystalline silica emissions in 2008 or prior years (ARB 2010e, 2010f). The locations of both the Kiefer Landfill and Triangle Rock Products, Inc. are shown in Exhibit 3.2-2, and both are potentially upwind of the SPA when prevailing winds are from the southwest or southeast. Because quantitative health risk assessments (HRAs) were not required from either facility by SMQAMD, the SMAQMD's prioritization thresholds were presumably not exceeded by the facilities, and therefore it is presumed that neither facility results in substantial health risks to nearby areas (ARB 2010e, 2010f).

SENSITIVE RECEPTORS

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These people include children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Structures that house these persons or places where they gather are defined as sensitive receptors.

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposures to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise may be short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Commercial and industrial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

The ARB defines sensitive receptors as residential uses, schools, daycare centers, playgrounds, and health care facilities (including hospitals and nursing homes) (ARB 2005a:ES-1). There are currently no sensitive receptors in the SPA.

EXISTING AIR QUALITY—ODORS

Typically odors are 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 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; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant or bakery) may be perfectly acceptable to another. It is also important to 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.

SMAQMD lists several examples of common land use types that typically generate substantial odor impacts including, but not limited to: wastewater treatment plants, landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants.

Sources of odors near the SPA include animal rendering (Sacramento Rendering Company, approximately ½ mile west of Sunrise Boulevard and Kiefer Boulevard, see Exhibit 3.2-2); composting (Lopez Ag Service, Inc. approximately ½ mile west of Sunrise Boulevard and Florin Road, see Exhibit 3.2-2); and waste disposal (Kiefer Landfill, approximately 2 miles southeast of the SPA, see Exhibit 3.2-2), all of which may be upwind of the SPA when the prevailing winds are from the west, southwest, or southeast. Approximately 375 complaints about odors were recorded by SMAQMD, and four notices of violation (2006) were issued to the Sacramento Rendering Company in the past five years (Sacramento County 2010). SMAQMD recorded no odor complaints about Kiefer Landfill or Lopez Ag Service, Inc. in the past 5 years. Specific information about the odor complaints, including where they occurred and whether they were confirmed or unconfirmed, was not available; however, SMAQMD generally considers odor sources to have a "substantial number of odor complaints" if they have had one confirmed complaint per year averaged over a 3-year period or three unconfirmed complaints per year averaged over a 3-year period (SMAQMD 2009:7-5).

Two of the three odor sources are close enough in proximity to the SPA that they violate SMAQMD's recommended odor screening distances from odor sources to sensitive receptors: Sacramento Rendering Company violates SMAQMD's recommended odor screening distance of 4 miles and Lopez Ag Service, Inc. is very near the recommended odor screening distance of 2 miles. Kiefer Landfill does not violate the recommended screening distance of 1 mile (SMAQMD 2009:7-4–7-5).

3.2.2 REGULATORY FRAMEWORK

CRITERIA AIR POLLUTANTS

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 primary and secondary NAAQS (Table 3.2-1). The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The Federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility for reviewing all state SIPs to determine conformation to the mandates of the CAAA and determine whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in application of sanctions to transportation funding and stationary air pollution sources in the air basin.

In addition, general conformity requirements were adopted by Congress as part of the CAAA and were implemented by EPA regulations in 1993. General conformity requires that all Federal actions conform to the SIP as approved or promulgated by EPA. The purpose of the general conformity program is to ensure that actions

taken by the Federal government do not undermine state or local efforts to achieve and maintain NAAQS. Before a Federal action is taken, it must be evaluated for conformity with the SIP. All reasonably foreseeable emissions, both direct and indirect, predicted to result from the action are taken into consideration and must be identified as to location and quantity. If it is found that the action would create emissions above *de minimis* threshold levels specified in EPA regulations, or if the activity is considered regionally significant because its emissions exceed 10% of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the project into conformance.

General conformity applies in both Federal nonattainment and maintenance areas. Within these areas, it applies to any Federal action not specifically exempted by the CAA or EPA regulations. Emissions from construction activities are also included. General conformity does not apply to projects or actions that are covered by the transportation conformity rule. If a Federal action falls under the general conformity rule, the Federal agency responsible for the action is responsible for making the conformity determination. In some instances, a state will make the conformity determination under delegation from a Federal agency. Private developers are not responsible for making a conformity determination, but can be directly affected by a determination. General conformity with respect to the project will be determined within the record of decision.

State Plans, Policies, Regulations, and Laws

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish CAAQS (Table 3.2-1). 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 areawide emission sources, and provides districts with the authority to regulate indirect sources.

Other ARB responsibilities include overseeing compliance with California and Federal laws by local air districts, 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.

ARB and local air pollution control districts are currently developing plans for meeting new national air quality standards for ozone and $PM_{2.5}$. California's adopted 2007 State Strategy was submitted to EPA as a revision to the SIP in November 2007 (ARB 2010g).

Regional and Local Plans, Policies, Regulations, and Ordinances

Sacramento Metropolitan Air Quality Management District

SMAQMD attains and maintains air quality conditions in Sacramento 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 SMAQMD 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. SMAQMD 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 and amendments thereof (CAAA), and the CCAA.

SMAQMD's *Guide to Air Quality Assessment in Sacramento County* is an advisory document that provides lead agencies, consultants, and project applicant with uniform procedures for addressing air quality in environmental documents. A new version of the guide was released in December 2009 and supersedes the version released in July 2004 (SMAQMD 2009). Lead agencies must use the December 2009 CEQA guide beginning January 1, 2010, for all projects that have not released a draft environmental document for public review on or before that date. The 2009 version of the guide does not include the development of new thresholds of significance; however,

it does include updated methodologies for evaluating potential impacts and a refined list of recommended mitigation measures. The 2009 guide contains the following applicable components:

- criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- methods available to mitigate air quality impacts; and
- information for use in air quality assessments and EIRs that will be updated frequently, such as air quality data, regulatory setting, climate, and topography.

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

- **Rule 201: General Permit Requirements.** Any project that includes the use of equipment capable of releasing emissions to the atmosphere may require permit(s) from SMAQMD before equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact SMAQMD early to determine whether a permit is required, and to begin the permit application process. Portable construction equipment (e.g., generators, compressors, pile drivers, lighting equipment) with an internal combustion engine over 50 horsepower (hp) are required to have a SMAQMD permit or ARB portable equipment registration.

- **Rule 402: Nuisance.** The developer and proposed project cannot emit any quantities of air contaminants or other materials that would cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public; or which endanger the comfort, repose, health, or safety of any persons or the public; or which cause or have natural tendency to cause injury or damage to business or property.

- **Rule 403: Fugitive Dust.** The developer or contractor is required to control dust emissions from earthmoving activities or any other construction activity to prevent airborne dust from leaving the SPA.

- **Rule 417: Wood Burning Appliances.** The developer or contractor is prohibited from installing any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments.

- **Rule 442: Architectural Coatings.** The developer or contractor is required to use coatings that comply with the VOC content limits specified in the rule.

In addition, effective as of October 10, 2005, if modeled construction-generated emissions for a project are not reduced to SMAQMD's threshold of significance (85 lb/day of NO_X) by applying the standard construction mitigation measures, then an off-site construction mitigation fee is recommended. The fee must be paid before a grading permit can be issued. This fee is used by SMAQMD to purchase off-site emissions reductions. Such purchases are made through SMAQMD's Heavy Duty Incentive Program, through which select owners of heavy-duty equipment in Sacramento County can repower or retrofit their old engines with cleaner engines or technologies. SMAQMD provides a Mitigation Fee Calculator for determining the fee for construction projects when off-site mitigation is needed (SMAQMD 2010).

Air Quality Plans

As described previously, the Sacramento region is currently designated as a both a Federal and state nonattainment area for ozone and particulate matter. The CAA requires plans which identify how Federal nonattainment areas will attain and/or maintain the NAAQS. The CAA requires EPA to review each plan and any plan revisions and to approve the plan or plan revisions if consistent with the CAA. Additionally, the CCAA requires air districts to develop attainment plans to meet the CAAQS by the earliest practicable date.

Key elements of these plans include emission inventories, emission control strategies and rules, air quality data analyses, modeling, air quality progress, and attainment or maintenance demonstrations.

Federal 1-Hour Ozone (Revoked Standard)

On November 6, 1991, the Sacramento region was designated a "serious" nonattainment area for the 1-hour ozone NAAQS with a November 15, 1999 attainment deadline. The Sacramento Federal Nonattainment Area (SFNA) included Sacramento and Yolo Counties, Placer and El Dorado Counties (except Lake Tahoe Basin portions), Solano County (eastern portion), and Sutter County (southern portion). The 1994 Sacramento Area Regional Ozone Attainment Plan (OAP) was prepared and demonstrated that a comprehensive control strategy to reduce VOC and NO_X emissions could achieve the ozone standard by 2005. In response, EPA granted a reclassification request from a "serious" area to a "severe" area with an extended attainment deadline of November 15, 2005, and approved the 1-hour ozone plan in 1997.

As a "severe nonattainment" area, the Sacramento Region was required to submit rate-of-progress milestone evaluations per Section 182(g) of the Federal Clean Air Act. SMAQMD prepared milestone reports for 1996, 1999, and 2002.

In 2004, EPA published the Phase 1 Rule to implement the 1997 8-hour ozone NAAQS which revoked the 1-hour ozone NAAQS effective June 15, 2005. In 2009, the AQMD submitted a request to exclude certain 1-hour exceedances due to elevated ozone levels caused by wildfires from June 21, 2008 through August 11, 2008. In the following year, the region requested EPA to make a formal attainment determination for the Sacramento nonattainment area based on the exclusion of these exceedances.

Federal 8-Hour Ozone (1997 NAAQS)

Sacramento County and the western portion of El Dorado County are also part of the SFNA, which also comprises of Yolo County and portions of Placer, and Solano Counties. As a nonattainment area, the region is also required to submit Rate of Progress Plans (ROPs) in accordance with the CAAA. Milestone reports were prepared for 1996, 1999, 2002, and most recently in 2006 for the 8-hour ozone standard. The 2008 Rate of Progress Plan included 2008 motor vehicle emission budgets for transportation conformity purposes and documented an updated emissions inventory for the region; EPA found the 2008 motor vehicle emission budgets adequate for transportation conformity purposes on March 29, 2006, but has not approved the plan to date.

The Sacramento region was classified by EPA on June 15, 2004, as a "serious" nonattainment area for the national 8-hour ozone standard with an attainment deadline of June 15, 2013. Emission reductions needed to achieve the air quality standard were identified based on air quality modeling. An evaluation of proposed new control measures and associated ROG and NO_X emission reductions concluded that no set of feasible controls was available to provide the needed emission reductions before the attainment deadline year. Given the magnitude of the shortfall in emission reductions and the schedule for implementing new control measures, the earliest possible attainment demonstration year for the Sacramento region is determined to be the "severe" area deadline of 2019.

Section 181(b)(3) of the CAA permits a state to request that EPA reclassify a nonattainment area to a higher classification and extend the time allowed for attainment. This process is appropriate for areas that must rely on longer term strategies to achieve the emission reductions needed for attainment.

The board of directors for each of the five air districts (including SMAQMD) that compose the SFNA requested that ARB submit a formal request for voluntary reclassification from "serious" to "severe" for the 8-hour ozone nonattainment area with an associated attainment deadline of June 15, 2019. ARB submitted that request on February 14, 2008, and the EPA approved the reclassification on May 5, 2010.

SMAQMD released a draft version of the 8-Hour Ozone 2011 Reasonable Further Progress Plan for the SFNA in February, 2008. On March 24, 2008, EPA published in the *Federal Register* a finding of Failure to Submit the 2011 Reasonable Further Progress Plan. The failure to submit finding triggered the following sanctions clocks:

- **Offset sanctions:** More stringent emission mitigation requirements for new and modified businesses, "major stationary sources," if a complete plan is not submitted within 18 months after EPA's finding of failure to submit the plan.

- **Federal highway funding sanctions:** Prohibiting transportation projects from receiving Federal transportation funding if a complete plan is not submitted within 24 months after EPA findings.

The sanctions clocks will stop once the air districts (including SMAQMD) submit the *2011 Reasonable Further Progress Plan* and EPA accepts the plan as complete. The SFNA submitted the plan to the EPA on July 7, 2008. On September 19, 2008, the EPA determined that the plan conforms to the completeness criteria in Title 40 of the Code of Federal Regulations, Part 51, Appendix V, which stops the sanction clocks under the CAA (SMAQMD 2008a and b).

The 2009 Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan was approved on December 19, 2008. The updated plan documents that the region is meeting requirements of the Clean Air Act for the 1997 8-hour ozone standard, including meeting minimum emission reductions and reaching the air quality standard not later than 2018. The plan included an updated emission inventory and established new emission budgets for transportation and general conformity; it also included commitments to adopt and implement new reasonably available control measures. On July 28, 2009, EPA determined the motor vehicle emission budgets for 2011, 2014, and 2017 to be adequate but found the budgets for 2018 inadequate; the plan is pending approval by the EPA.

Federal 8-Hour Ozone (2008 NAAQS and 2010 Reconsideration)

On March 12, 2008, EPA strengthened its NAAQS for ground-level ozone, the primary component of smog. These changes will improve both public health protection and the protection of sensitive trees and plants. EPA revised the 8-hour "primary" ozone standard, designed to protect public health, to a level of 0.075 ppm. The previous standard, set in 1997, was 0.08 ppm.

EPA also strengthened the secondary 8-hour ozone standard to the level of 0.075 ppm making it identical to the revised primary standard. In addition, EPA changed the Air Quality Index (AQI) to reflect the new primary standard. The AQI is EPA's color-coded tool designed for use by state and local authorities to inform the public about daily air pollution levels in their communities.

On January 6, 2010, EPA proposed to reconsider the 2008 NAAQS for ground-level ozone. The proposed revisions are based on a reevaluation of the scientific evidence about ozone and its effects on people and the environment. EPA is proposing to strengthen the 8-hour "primary" ozone standard, designed to protect public health, to a level within the range of 0.060-0.070 ppm. EPA is also proposing to establish a distinct cumulative, seasonal "secondary" standard, designed to protect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. EPA is proposing to set the level of the secondary standard within the range of 7-15 ppm-hours.

State 1-Hour Ozone

The Sacramento region is designated a nonattainment area for the state 1-hour and 8-hour ozone standards, and SMAQMD is required to undertake planning efforts to reach this health-based standard at the county level (i.e., Sacramento County, among others, which are also part of the SFNA).

SMAQMD, in coordination with the air quality management districts and air pollution control districts of El Dorado, Placer, Solano, Sutter, and Yolo Counties, prepared and submitted the 1994 *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 annual progress reports and triennial assessments 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 OAP, which stressed attainment of ozone standards and focused on strategies for reducing ROGs and NO_X.

Federal PM

PM_{10}

In 2002, EPA officially determined that Sacramento County had attained the PM_{10} NAAQS based on PM_{10} air quality monitoring data recorded during 1998 to 2000, which showed no measured exceedances of the 24-hour PM_{10} NAAQS or violations of the annual standard between 1998 and 2000. The current air monitoring network includes seven PM_{10} stations throughout Sacramento County, and there have not been any measured violations of the PM_{10} NAAQS to date.

To reclassify Sacramento County as attainment for the national PM_{10} standards, SMAQMD submitted their PM_{10} Implementation/Maintenance Plan and Redesignation Request for Sacramento County on October 28, 2010. The plan shows that the 1987 standard for PM_{10} was attained and establishes the strategy for maintaining the standard through 2022.

$PM_{2.5}$

On October 16, 2006, the EPA promulgated a new 24-hour standard for $PM_{2.5}$, which lowered the daily standard from 65µg/m3 to 35µg/m^3 to protect the general public from short term exposure of the fine particulate matter. Because Sacramento County does not meet the new standards, in October, 2007, the Air District completed a boundary analysis based on the EPA's nine factor requirements. In December, 2007, the California ARB made their recommendations to the EPA for the nonattainment area boundary.

The EPA Administrator signed the final $PM_{2.5}$ nonattainment designations for Sacramento on October 8, 2009, and an attainment plan must be submitted not later than 3 years after the effective date of the designation, which must include transportation conformity budgets and control measures.

State PM

In 2003, the California Legislature enacted Senate Bill 656 (Sher, Health and Safety Code Section 39614) to reduce adverse health impacts, including development of lung and heart disease and premature death from exposure to particulate matter levels above the state ambient air quality standards.

SB 656 required ARB to develop a list of the most readily available, feasible, and cost-effective control measures that could be employed to reduce PM emissions. The ARB list is based on California rules and regulations existing as of January 1, 2004, and was adopted by ARB in November 2004. Subsequently, under SB 656, each air district is required to prioritize the measures identified by ARB, based on the cost effectiveness of the measures and their effect on public health, air quality, and emission reductions. On July 28, 2005, SMAQMD adopted an implementation schedule for the most cost-effective measures.

Sacramento County General Plan

The goals, objectives, and policies from the *Sacramento County General Plan* (1996) regarding air quality and odors that are applicable to the Proposed Project and other alternatives under consideration are listed in Appendix K.

City of Rancho Cordova General Plan

Goals and policies from the *City of Rancho Cordova General Plan* (City General Plan 2006) relating to air quality and odors that are applicable to the Proposed Project and other alternatives under consideration are listed in Appendix K.

TOXIC AIR CONTAMINANTS

TACs are not considered criteria air pollutants and are not specifically addressed through the setting of ambient air quality standards. Instead, EPA and ARB regulate hazardous air pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by SMAQMD establish the regulatory framework for TACs (see discussion under "State and Local Toxic Air Contaminant Programs" below).

Federal Hazardous Air Pollutant Program

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAPs). The NESHAPs for major sources of HAPs may differ from those for area sources. 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 CAAA called on EPA to promulgate emissions standards in two phases. In the first phase (1992–2000), EPA developed technology-based emissions standards designed to reduce emissions as much as feasible. 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, EPA promulgated health risk–based emissions standards were 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 of, at a minimum, benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the CAAA required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

State and Local Toxic Air Contaminant Programs

TACs can be separated into carcinogens and non-carcinogens based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur and cancer risk is expressed as excess cancer cases per one million exposed individuals. Non-carcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to non-carcinogens is expressed in using a Hazard Index (HI), which is the ratio of expected exposure levels to acceptable health-acceptable exposure levels.

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807 [Chapter 1047, Statutes of 1983]) and the Air Toxics Hot Spots Information and Assessment Act (AB 2588

[Chapter 1252, Statutes of 1987]). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, particulate matter emissions from diesel exhaust was added to the ARB list of TACs.

After 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; for example, the ATCM limits truck idling to 5 minutes (Title 13, Section 2485 of the California Code of Regulations).

The Air Toxics Hot Spots Information and Assessment Act requires that toxic air emissions from stationary sources be quantified and compiled into an inventory according to criteria and guidelines developed by the ARB, that each facility be prioritized to determine whether a risk assessment must be conducted, that the risk assessments be conducted according to methods developed by OEHHA, that the public be notified of "significant risks" (as defined by OEHHA) posed by nearby facilities, and that emissions which result in a significant risk be reduced. Since the amendment of the statute in 1992 by enactment of Senate Bill (SB) 1731, facilities that pose a potentially significant health risks to the public are required to reduce their risks, thereby reducing the near-source exposure of Californians to toxic air pollutants. Owners of facilities found to pose significant risks by a district must prepare and implement risk reduction audit and plans within six months of the determination.

ARB has adopted control measures for DPM and more stringent emissions 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 rule for public-transit bus fleets and emissions standards for new urban buses. These new rules and standards include all the following elements:

- more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines;
- zero-emission bus demonstration and purchase requirements applicable to transit agencies; and
- reporting requirements, under which transit agencies must demonstrate compliance with the public-transit bus fleet rule.

Recent and future milestones include the low-sulfur diesel fuel requirement and tighter emissions standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, replacing older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, DPM) have been appreciably reduced over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that DPM 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.

In addition, the *Air Quality and Land Use Handbook: A Community Health Perspective*, published by ARB, provides guidance on land use compatibility with sources of TACs (ARB 2005a). The handbook is not a law or adopted policy but 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 protect children and other sensitive members of the population. In addition, for projects that would site receptors in close proximity to major roadways, lead agencies are directed to use the SMAQMD's *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways* (*Protocol*). The Protocol was developed to provide further guidance on ARB's Land Use Handbook to assist local land use jurisdictions in assessing the potential cancer risk of siting sensitive land uses adjacent to major roadways (SMAQMD 2009:5-10).

SB 352 (California Education Code Section 17213, California Public Resources Code Section 21151.8) expands on previous requirements for the review of TAC sources near school sites. Accordingly, SB 352 requires that any school site located within 500 feet of the edge of the closest travel lane of a freeway or other busy traffic corridor be reviewed for potential health risks.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. The siting of new stationary sources of TACs is subject to SMAQMD Rule 202 (New Source Review). Each new stationary source is evaluated to determine whether it has the potential to emit TACs. SMAQMD assesses the impact from TACs based on its guidance document—Supplemental Risk Assessment Guidelines for New and Modified Sources—as well guidance documents from OEHHA, ARB, and the California Air Pollution Control Officers Association. SMAQMD requires emission controls, similar to BACT, called Toxic Best Available Control Technology (T-BACT) for certain sources.

In addition to T-BACT requirements, permits for equipment that may emit TACs may also contain conditions required by the NESHAPs and ATCMs promulgated by the EPA and ARB, respectively (Rules 801 and 904). In short, a new stationary source of TACs would not receive the authority to construct or permit to operate if it would result in:

- an incremental increase in cancer risk greater than 10 in one million at any off-site receptor; and/or
- an off-site ground-level concentration of non-carcinogenic TACs generated from the project that would result in an HI greater than 1 (unless approved by OEHHA).

These permitting requirements are identical to SMAQMD's thresholds of significance for TACs generated by stationary sources or land uses that included nonpermitted sources (e.g., truck distribution yards). Therefore, lead agencies can determine that a new stationary source of TACs that attains the authority to construct and permit to operate from the SMAQMD would not exceed the applicable TAC thresholds of significance. (SMAQMD 2009:5-7).

If a source cannot reduce the risk below the threshold of significance even after T-BACT has been implemented, the SMAQMD 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 for controlling TACs when retrofitting emissions sources.

It is important to note that the air quality permitting process applies only to stationary sources; properties that may be exposed to elevated levels of TACs from nonstationary sources (e.g., high traffic-volume roadways, truck yards) and the nonstationary sources themselves are not subject to this process or to any requirements of T-BACT implementation. Rather, emissions controls on nonstationary sources are subject to regulations implemented on the state and Federal level.

Odors

SMAQMD adopted a nuisance rule that addresses odor exposure. Rule 402 states that no person shall discharge from any source whatsoever such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons, or to the public, or that endanger the comfort, repose, health, or safety of any such persons, or the public, or that cause to have a natural tendency to cause injury or damage to business or property. The provisions of Rule 402 do not apply to odors emanating from agricultural operations necessary for the growing of crops or raising of fowl or animals.

SMAQMD recommends that odor impacts be addressed in a qualitative manner and include a discussion about whether the project would result in excessive nuisance odors, as defined under the California Code of Regulations and Section 41700 of the California Health and Safety Code, and thus would constitute a public nuisance related to air quality.

Two situations increase the potential for odor problems. The first occurs when a new odor source is located near existing sensitive receptors. The second occurs when new sensitive receptors are developed near existing sources of odors. In the first situation, SMAQMD recommends operational changes, add-on controls, process changes, or buffer zones where feasible to address odor complaints. In the second situation, the potential conflict is considered substantial if the new sensitive receptor is at least as close as any other site that has already experienced substantial odor problems related to the odor source. For projects being developed near a source of odors where there is no nearby development that may have filed complaints, and for odor sources being developed near existing sensitive receptors, SMAQMD recommends that the determination of potential conflict be based on the distance and frequency at which odor complaints from the public have occurred in the vicinity of a similar facility.

Odors in Sacramento County are regulated by SMAQMD, although there are no specific rules or standards related to odor emissions. Any actions related to odors are based on citizen complaints to local governments and/or SMAQMD.

3.2.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines, as amended and guidance from SMAQMD. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its impacts. The Proposed Project or other alternatives under consideration were determined to result in a significant impact related to air quality and odors if they would do any of the following:

- 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,
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS (including releasing emissions that exceed quantitative thresholds for ozone precursors),
- expose sensitive receptors to substantial pollutant concentrations, or
- create objectionable odors affecting a substantial number or people.

As stated in Appendix G, the significance criteria established by the applicable air quality management district may be relied on to make the above determinations. Thus, in accordance with SMAQMD-recommended thresholds for evaluating project-related air quality impacts (SMAQMD 2009), implementation of the Proposed Project or other alternatives under consideration would result in a significant impact if operation of the Proposed Project or other alternatives under consideration would:

- generate construction-related criteria air pollutant or precursor emissions that exceed the SMAQMD-recommended threshold of 85 lb/day for NO_X, or result in or substantially contribute (at a level equal to or greater than 5%) to emissions concentrations of PM_{10} and $PM_{2.5}$ that exceed the NAAQS or CAAQS (e.g., 50 micrograms per cubic meter [$\mu g/m^3$] [24-hr] or 20 $\mu g/m^3$[annual arithmetic mean] for PM_{10} and 12 $\mu g/m^3$[annual arithmetic mean] for $PM_{2.5}$);
- generate long-term regional criteria air pollutant or precursor emissions that exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, or result in or substantially contribute (at a level

equal to or greater than 5%) to emissions concentrations of PM_{10} and $PM_{2.5}$ that exceed the NAAQS or CAAQS (e.g., 50 µg/m^3 [24-hr] or 20 µg/m^3[annual arithmetic mean] for PM_{10} and 12 µg/m^3[annual arithmetic mean] for $PM_{2.5}$);

- contribute to localized concentrations of air pollutants at nearby receptors that would exceed applicable ambient air quality standards;

- Stationary sources and sources hosting large numbers of diesel trucks (i.e., loading docks or delivery areas associated with foreseeable commercial or retail land uses) that expose sensitive receptors to TAC emissions that exceed an incremental increase of 10 in 1 million for the carcinogenic risk (i.e., the risk of contracting cancer) and/or a noncarcinogenic HI of 1.0 for the Maximally Exposed Individual (MEI, for stationary source TAC emissions); or

- expose sensitive receptors to excessive nuisance odors generated by the project, as defined under SMAQMD Rule 402 (see "Odors" under "Regional and Local Plans, Policies, Regulations, and Ordinances" above).

- For mobile TAC sources, that is, freeways, high-volume roadways, or roadways hosting larger-than-average percentages of diesel trucks, the threshold of significance that will be used for the purposes of this DEIR/DEIS is 276 excess cancers in a million (SMAQMD 2011). The significance threshold selected for this DEIR/DEIS is a conservative approach based on the worst reasonable case location for new sensitive receptors within Sacramento County. The 276 excess cancer cases in one million is based on a hypothetical sensitive receptor located 50 feet from the edge of the nearest travel lane for the highest peak traffic volume reported by Caltrans for Sacramento County, reduced by 70% (SMAQMD 2011). For comparison, the ARB estimated health risk from TACs to be 360 excess cancer cases per million people in the Sacramento Valley Air Basin (ARB 2005b, 2009a). The 70-percent reduction in risk is the same that was used in ARB's publication, *Air Quality and Land Use Handbook: A Community Health Perspective*, to recommend that sensitive land uses be buffered by at least 500 feet from a freeway or major roadway (ARB 2005). This recommendation "was based on traffic related studies that showed a 70 percent drop in PM concentrations at a distance of 500 feet from the roadway." (ARB 2011)

Buffer distances (or other necessary TAC mitigation) would be largest for the reduction of cancer risk, as compared to those buffer distances/measures required to mitigate more acute health risks represented by the HI (Bay Area Air Quality Management District [BAAQMD] 2010). For this reason, the HI will not be used for determination of significance for the impact of exposure of sensitive receptors to TACs from freeways, high-volume roadways or roadways hosting larger-than-average percentages of diesel trucks.

ANALYSIS METHODOLOGY

Temporary and short-term construction-generated emissions of criteria air pollutants and ozone precursors were assessed in accordance with methods recommended by SMAQMD. It is common CEQA and NEPA practice to examine certain types of air pollutants within the context of a single impact analysis. Ozone precursor emissions (NO_X and ROG) and particulate matter emissions (PM_{10}, $PM_{2.5}$) are addressed together under the temporary and short-term, construction-related impact (3.2-1) and the long-term, operational impact (3.2-2) because:

(1) all of these pollutants have related potential public health effects and the basis of the impact analysis is the level of potential public health effects;

(2) the combined analysis allows for a clearer and more complete answer to three related "Appendix G" CEQA Guidelines questions under Section III, "Air Quality": a) conflicts with air quality plans; b) violations of an air quality standard; and c) cumulatively considerable increase in criteria air pollutant in nonattainment area;

(3) the sources of these emissions and the secondary formation of these pollutants that can result in public health impacts are related to one another; and

(4) mitigation measures developed to address these pollutants are also related.

Where quantification was required, emissions were modeled using the URBEMIS 2007 Version 9.2.4 computer program (Rimpo and Associates 2008), as recommended by SMAQMD's *Guide to Air Quality Assessment in Sacramento County* (SMAQMD 2009). URBEMIS was used to determine whether temporary and short-term construction-related emissions of criteria air pollutants associated with development of the Proposed Project and the other four action alternatives under consideration would exceed applicable thresholds and where mitigation would be required to reduce the magnitude of the impact. Modeling was based on project-specific data, when available. However, when project-specific information (e.g., amount of land to be disturbed/graded per day, types of equipment to be used, number of construction employees) was not available, reasonable assumptions and default settings were used to estimate criteria air pollutant emissions. Information about grading activities and the locations and occupancy timing of future receptors is not known at the time of writing this EIR/EIS.

A detailed list of modeling assumptions is provided in Appendix L. Predicted temporary and short-term construction-generated emissions were compared with applicable SMAQMD thresholds for determination of significance. Although the primary purpose of estimating daily construction emissions is to analyze the project with respect to the SMAQMD's mass emission threshold for construction-generated NO_X, the SMAQMD also recommends reporting the emissions of ROG, PM_{10}, $PM_{2.5}$ and CO_2 for the purposes of added disclosure to readers of the environmental impact analysis (SMAQMD 2009:3-4).

It is assumed that development of the SPA would occur over a large area (approximately 1,250 acres, about 1,017 acres of which would be graded), and would occur in three phases over the course of 20 years (6.67 years per phase). Large portions of the SPA, the largest being 570 acres or 56% of the total graded area, would undergo construction during a single phase, which would require substantial amounts of earthwork and grading.

Apart from the general construction phasing map (Exhibit 2-22, Chapter 2.0, "Alternatives"), a more detailed schedule describing the timing and location of construction activities under the Proposed Project and the other four action alternatives was not available at the time of writing this EIR/EIS. Construction of the site is anticipated to commence in 2012 and last until approximately 2032.

Given that exhaust emission rates of the construction equipment fleet are expected to decrease over time due to State and SMAQMD-led efforts, maximum daily construction emissions were estimated using the earliest calendar when construction would begin (i.e., 2012) in order to generate conservative estimates. It is anticipated, however, that in later years, advancements in engine technology, retrofits, and turnover in the equipment fleet would result in lower levels of emissions. Accordingly, maximum daily construction emissions in 2012 for the Proposed Project and the other four action alternatives were estimated using the URBEMIS 2007 Version 9.2.4 computer program (Rimpo and Associates 2008). URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information including building size, land use and type, disturbed acreage, as well as seasons and years in which construction occurs. Project-generated emissions of criteria air pollutants (e.g., PM_{10}) and precursors (i.e., ROG and NO_X) were modeled based on general information provided in the project description (see Chapter 2, "Alternatives), and default SMAQMD-recommended settings and parameters attributable to the proposed land use types and site location. URBEMIS also divides construction activity into distinct construction phases: site grading, asphalt paving, building construction, and the application of architectural coatings.

To provide a conservative estimate of annual construction emissions for the Proposed Project and the other action alternatives, phase two of construction, having the largest area, was assumed to commence in 2012 rather than 2019, and occur over a period of 6.67 years. All construction activity sub-phases were assumed to occur simultaneously over the course of a year during the typical dry months (May to October). Because of the size of the project and the extended period until full buildout, it is likely that the different types of construction activities (i.e. site grading, trenching, asphalt paving, building construction, and application of architectural coatings) could occur simultaneously at various locations within each phase and sub-phase of the SPA (see Exhibit 2-22, Chapter

2.0, "Alternatives"). In other words, site grading, asphalt paving, building construction, and the application of architectural coatings could take place within defined areas of the SPA at the same time during each of the three construction phases.

Construction emissions levels associated with the Proposed Project and the other action alternatives would differ according to the total number of residential units, commercial square footage, office square footage, and school square footage to be developed. Thus, for the Proposed Project and the other action alternatives, the subtotal quantities of all land use types were multiplied by 0.56 and divided by 6.67 years to calculate the annual average level of annual construction activity (e.g., residential units, commercial square footage). This corresponds with the largest identified construction phase, which represents 56% of the total graded area and which would undergo construction during an estimated 6.67-year construction schedule.

With respect to construction-generated emissions of PM_{10}, SMAQMD typically recommends that project-level analyses determine the maximum concentration of PM_{10} emissions by performing air dispersion modeling with the EPA's AERMOD model if the maximum daily acreage of ground disturbance would exceed 15 acres. Given the construction schedule and phases, it is possible, but unlikely that more than 15 acres of ground disturbance activity would occur in one day (85 graded acres per year is a conservative estimate, assuming construction only occurs 22 days per month for 6 months per year, resulting in an average graded area of 0.65 acres per day). By contrast, URBEMIS assumes 25% of 85 acres is graded per day.

Long-term (i.e., operational) regional emissions of criteria air pollutants and precursors, including mobile- and area-source emissions, were also quantified using the URBEMIS 2007 Version 9.2.4 computer model (Rimpo and Associates 2008) assuming that full buildout of the project would occur in the year 2032. The year 2032 was used in URBEMIS as the project buildout year; however, the year 2030 was used to calculate mobile-source emissions within URBEMIS because analysis years could only be selected in five-year increments. Area-source emissions were modeled according to the size and type of land uses proposed under all five action alternatives. Mobile-source emissions were modeled based on the net increase in daily vehicle trips and the net increase in regional VMT that would result from full build out of all five action alternatives. VMT and trip parameters were obtained from the traffic analysis prepared by Fehr & Peers (2010). Predicted long-term operational emissions were compared with applicable SMAQMD thresholds for determination of significance.

Long-term operational exposures of sensitive receptors to emissions of TACs was assessed qualitatively. For the purposes of evaluating health risks, the guidance contained in ARB's *Air Quality and Land Use Handbook: A Community Health Perspective,* was used. The *Air Quality and Land Use Handbook* includes recommendations for the siting of sensitive receptors near facilities associated with TAC emissions, such as freeways and high-traffic roads, commercial distribution centers, dry cleaners, gasoline stations, and industrial facilities (ARB 2005). Additionally, guidance contained within SMAQMD's *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways, Version 2.4* (SMAQMD 2011) was used to assess exposures of sensitive receptors to nearby, off-site mobile sources (i.e., Sunrise Blvd., Grant Line Road and SR 16). Neither of the abovementioned guidance documents is regulatory, and neither claims to provide significance thresholds for the health risks associated with exposures of sensitive receptors to nonpermitted sources of TACs; therefore, they are not used for that purpose. Ultimately, the impact conclusion is based on whether the Proposed Project or other action alternatives would result in exposures of sensitive receptors to substantial levels of TACs, based on location, source strength, exposure duration, and meteorology/dilution during transport from source to receptor. Other important factors to consider include the estimated TAC exposure levels at proposed sensitive receptors compared to background levels in the SVAB and the necessity to disclose an accurate understanding of the potential health risks so they can be considered in the planning process.

IMPACT ANALYSIS

Impacts that would occur under each alternative development scenario are identified as follows: NP (No Project), NCP (No USACE permit), PP (Proposed Project), BIM (Biological Impact Minimization), CS (Conceptual

Strategy), and ID (Increased Development). The impacts for each alternative are compared relative to the PP at the end of each impact conclusion (i.e., similar, greater, lesser).

Decisions concerning the project's conformity with the Federal Clean Air Act (i.e., the "conformity analysis") will be made in the USACE record of decision.

IMPACT 3.2-1 **Generation of Temporary and Short-Term Construction-Related Emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$.** *Project-generated construction activities would result in temporary and short-term emissions of ROG and NO_X, ozone precursors, fugitive PM dust and PM exhaust. Emissions of NOx would exceed SMAQMD-recommended thresholds and PM could substantially contribute to localized concentrations that exceed the NAAQS and CAAQS. Thus, project-generated, construction-related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, and/or conflict with air quality planning efforts.*

NP

Because the project would not be implemented under the No Project Alternative, **no direct** or **indirect** project-related impacts would occur related to construction emissions of NO_X and PM_{10}. ***[Lesser]***

NCP

Construction emissions are considered temporary and short term in duration, but have the potential to represent a significant air quality impact. Respirable particulate matter (PM_{10}) and $PM_{2.5}$ are among the pollutants of greatest concern during construction activities. Particulate emissions from construction activities can lead to adverse health effects and nuisance concerns, such as reduced visibility and soiling of exposed surfaces.

Particulate emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle and equipment exhaust. Construction emissions of PM_{10} and $PM_{2.5}$ can vary greatly depending on the level of activity, the specific operations taking place, the number and types of equipment operated, local soil conditions, weather conditions, and the amount of earth disturbance (e.g., site grading, excavation, cut-and-fill).

Emissions of ozone precursors, ROG and NO_X, are primarily generated from mobile sources and vary as a function of vehicle trips per day associated with delivery of construction materials, the importing and exporting of soil, vendor trips, and construction worker commute trips; and the types and number of heavy-duty, off-road equipment used and the intensity and frequency of their operation. A large portion of construction-related ROG emissions also result from the application of asphalt and architectural coatings and vary depending on the amount of coatings and paving applied each day.

Development of the SPA would occur over a large area and would require substantial amounts of earthwork and grading.

Table 3.2-4 summarizes the modeled worst-case daily emissions of ROG, NO_X, PM_{10} and $PM_{2.5}$ associated with construction of the No USACE Permit Alternative and the other four action alternatives. Refer to Appendix L for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs.

As shown in Table 3.2-4, the maximum daily level of construction-generated NO_X emissions under the No USACE Permit Alternative would not exceed the SMAQMD-recommended threshold of 85 lb/day. It should be noted that for purposes of this analysis, the maximum daily emissions level estimates displayed in Table 3.2-4 assume that the intensity of construction activity would be the same during the 20 years of construction on the site.

Table 3.2-4
Summary of Modeled Maximum Daily Criteria Air Pollutant and Precursor Emissions Associated with Construction Activities

Source	Emissions (lb/day)[1,2]					
	ROG	NO_X	PM_{10}(Dust)	$PM_{2.5}$(Dust)	PM_{10}(Exhaust)	$PM_{2.5}$(Exhaust)
No USACE Permit Alternative						
Unmitigated	153	94	283	59	6	5
Mitigated[3]	—	75	71	—	3	—
Proposed Project Alternative						
Unmitigated	194	141	428	89	8	7
Mitigated[3]	—	113	107	—	4	—
Biological Impact Minimization Alternative						
Unmitigated	157	107	348	73	6	6
Mitigated[3]	—	86	87	—	3	—
Conceptual Strategy Alternative						
Unmitigated	172	110	392	82	7	6
Mitigated[3]	—	88	98	—	4	—
Increased Development Alternative						
Unmitigated	266	145	487	102	8	7
Mitigated[3]	—	116	122	—	4	—
SMAQMD Significance Threshold[3]	—	85	50 µg/m^3 24-hour standard; 20 µg/m^3 Annual Arithmetic Mean	12 µg/m^3 Annual Arithmetic Mean	Threshold is for total dust + exhaust	Threshold is for total dust + exhaust

Notes: ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; lb/day = pounds per day; SMAQMD = Sacramento Metropolitan Air Quality Management District; µg/m^3 = micrograms per cubic meter

[1] Maximum daily construction emissions are representative of a summer construction day in the earliest construction year (2012) assuming that all types of construction activities (i.e., grading, asphalt paving, building construction, and architectural coatings) would take place simultaneously at various locations of the Specific Plan Area. The detailed breakdown of land use types and other input parameters used in the modeling, as well as detailed modeling output, are included in Appendix L.

[2] The mitigated total reflects a 75% reduction in fugitive PM_{10} dust emissions, a 45% reduction in PM_{10} exhaust emissions from off-road diesel equipment, and a 20% reduction in NO_X emissions from off-road diesel equipment, as required by Mitigation Measure 3.2-1a, but not the purchase of offsets for NO_X, as required by Mitigation Measure 3.2-1b. Reduction levels that would result from other measures listed under Mitigation Measure 3.2-1a cannot be quantified. The purchase of offsets for NO_X, as required by Mitigation Measure 3.2-1b, however, would ensure that NO_X would be reduced to 85 lb/day.

[3] SMAQMD does not have mass emissions thresholds for construction-related emissions of ROG, PM_{10}, or $PM_{2.5}$. California ambient air quality standards (CAAQS) and national ambient air quality standards (NAAQS) do not distinguish between type of PM, only size (i.e. 10 microns vs. 2.5 microns). After the analysis of mass PM emissions for this EIR/EIS was prepared, SMAQMD released new concentration-

Table 3.2-4
Summary of Modeled Maximum Daily Criteria Air Pollutant and Precursor Emissions Associated with Construction Activities

Source	Emissions (lb/day)[1,2]					
	ROG	NO_X	PM_{10}(Dust)	$PM_{2.5}$(Dust)	PM_{10}(Exhaust)	$PM_{2.5}$(Exhaust)

based significance thresholds for PM_{10} and $PM_{2.5}$. The new thresholds would not change the conclusions in this EIR/EIS because SMAQMD assumes that projects would not exceed the new thresholds if they implement all Basic Construction Emission Control Practices and no more than 15 acres is disturbed in a day. For disclosure purposes, mass PM emissions are reported. Although SMAQMD does not have a separate short-term, construction-related threshold for ROG, according to the SMAQMD CEQA Guidelines, "The District addresses construction-related emissions of ROG through Rule 442, which regulates ROG emissions from architectural coatings" (SMAQMD 2011). This Rule establishes numeric limits for ROGs in architectural coatings and specifies test methods for determining the level of ROGs in these products.

Source: Modeling performed by AECOM in 2011

As noted above under "Analysis Methodology," unmitigated PM emissions reported in Table 3.2-3 represent the worst-case scenario, assuming that 25% of the site (85 acres) is graded in a single day (SMAQMD 2009:3-7). Based on the construction phasing map (which provides some information regarding construction activities and potential proximity to existing and new sensitive receptors), and the relatively high concentrations of daily PM_{10} and $PM_{2.5}$ dust emissions, it is possible that the ground-disturbing activities associated with site construction could result in concentrations of PM_{10} and $PM_{2.5}$ that exceed the significance thresholds.

Because mass emissions of NO_X would exceed SMAQMD's recommended threshold of significance of 85 lb/day, construction-generated emissions of criteria air pollutant precursors could contribute substantially to an existing or projected regional air quality violation. Construction emissions of criteria air pollutants (particularly localized PM_{10} dust) could expose sensitive receptors to substantial pollutant concentrations, particularly when grading and other ground disturbance activities occurs near land uses that have already been developed (and where people are already living or working) within the SPA. In addition, because the SMAQMD's significance threshold for NO_X approximately correlates with reductions from heavy-duty vehicles and reduction requirements for land use project emissions in the SIP, construction-generated emissions could also conflict with air quality planning efforts. This would be a **direct significant** impact. **No indirect** impacts would occur. ***[Lesser]***

Mitigation Measure 3.2-1a: Implement Measures to Control Air Pollutant Emissions Generated by Construction Activities.

To reduce temporary and short-term construction emissions, the project applicant for any particular discretionary development application shall require their contractors to implement SMAQMD's list of Basic Construction Emission Control Practices, Enhanced Fugitive PM Dust Control Practices, and Enhanced Exhaust Control Practices (listed below) or whatever feasible mitigation measures are recommended by SMAQMD at the time individual portions of the site undergo construction. In addition to the current SMAQMD-recommended measures, construction operations shall comply with all future additional SMAQMD rules and regulations that may be applicable at the time of construction.

Basic Construction Emission Control Practices

- Water all exposed surfaces two times daily. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered.

- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.

- Limit vehicle speeds on unpaved roads to 15 miles per hour (mph).

- All roadways, driveways, sidewalks, parking lots to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes (as required by the state airborne toxics control measure [Title 13, Section 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site.

- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determine to be running in proper condition before it is operated.

Enhanced Fugitive PM Dust Control Practices – Soil Disturbance Areas

- Water exposed soil with adequate frequency for continued moist soil. However, do not overwater to the extent that sediment flows off the site.

- Suspend excavation, grading, and/or demolition activity when wind speeds exceed 20 mph.

- Install wind breaks (e.g., plant trees, solid fencing) on windward side(s) of construction areas.

- Plant vegetative ground cover (fast-germinating native grass seed) in disturbed areas as soon as possible. Water appropriately until vegetation is established.

Enhanced Fugitive PM Dust Control Practices – Unpaved Roads

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

- Treat site accesses to a distance of 100 feet from the paved road with a 6 to 12-inch layer of wood chips, mulch, or gravel to reduce generation of road dust and road dust carryout onto public roads.

- Post a publicly visible sign with the telephone number and person to contact at the construction site regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of SMAQMD and the City contact person shall also be posted to ensure compliance.

Enhanced Exhaust Control Practices

- Provide a plan, for approval by the City of Rancho Cordova Community Development Department and SMAQMD, demonstrating that the heavy-duty (50 hp or more) 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 current ARB fleet average that exists at the time of construction.

- 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.

- Submit to the City of Rancho Cordova Community Development Department and SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 hp, that would be used an aggregate of 40 or more hours during any portion of the construction project. The inventory shall include the horsepower rating, engine production year, and projected hours of use for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs.

- Provide SMAQMD, at least 48 hours prior to the use of heavy-duty off-road equipment, with the anticipated construction timeline including start date, and name and phone number of the project manager and on-site foreman. SMAQMD's Construction Mitigation Calculator can be used to identify an equipment fleet that achieves this reduction (SMAQMD 2010a).

- Ensure that emissions from all off-road diesel powered equipment used on the SPA do not exceed 40% opacity for more than three minutes in any one hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) shall be repaired immediately, and the City and SMAQMD shall be notified within 48 hours of identification of non-compliant equipment.

- Perform weekly visual surveys of all in-operation equipment and provide a monthly summary of the visual survey results to the City and SMAQMD throughout the duration of project construction. The monthly summary will not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey. SMAQMD staff and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this mitigation measure shall supersede other SMAQMD or state rules or regulations.

- Comply with any regulation or new guidance applicable to construction emissions that has been adopted by SMAQMD at the time of construction. Compliance with the regulation or new guidance may completely or partially replace this mitigation if it is equal to or more effective than the mitigation contained herein, and if SMAQMD so permits. Such a determination must be approved by SMAQMD.

Mitigation Measure: Implement Portions of Mitigation Measure 3.4-1.

The project applicant for any particular discretionary development application shall implement the following submeasures from Mitigation Measure 3.4-1, which would also reduce construction-related criteria pollutant emissions:

- Improve fuel efficiency from construction equipment by using equipment with new technologies (repowered engines, electric drive trains).

- Use alternative fuels for electricity generation and welding at construction sites (such as propane or solar) or, use electrical power.

- Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.

- Use locally sourced materials for construction (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, sidewalk and curb materials).

- Use EPA-certified SmartWay trucks for deliveries and equipment transport. Additional information about the SmartWay Transport Partnership Program is available from ARB's Heavy-Duty Vehicle Greenhouse Gas Measure (ARB 2009c) and EPA (2009).

In addition to reducing construction-related GHGs, implementation of Mitigation Measure 3.4-1 would further reduce temporary and short-term construction-related emissions of NO_X and PM, but the reductions are not quantifiable because the reduction in the direct and indirect emissions of these pollutants due to some displacement of conventional equipment, materials, and material and worker transport-related VMT are unknown at the time of writing this DEIR/DEIS.

Implementation: The project applicants for any particular discretionary development application.

Timing: Before the approval of all grading plans by the City and throughout project construction, where applicable, for all project phases.

Enforcement: City of Rancho Cordova Community Development Department, in consultation with the Sacramento Metropolitan Air Quality Management District.

PP, BIM, CS

Predicted temporary and short-term construction-generated emissions were modeled as discussed in the Analysis Methodology section and results are presented in Table 3.2-4, above. It is possible that the ground-disturbing activities associated with site construction could result in concentrations of PM_{10} and $PM_{2.5}$ that exceed the significance thresholds.

The maximum daily level of construction-generated NO_X emissions under the Proposed Project, Biological Impact Minimization, and Conceptual Strategy Alternatives would exceed the SMAQMD-recommended threshold of 85 lb/day. Because mass emissions of NO_X would exceed SMAQMD's recommended threshold of significance of 85 lb/day, construction-generated emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation. Also, construction emissions of criteria air pollutants and precursors could expose sensitive receptors to substantial pollutant concentrations, particularly when grading and other ground disturbance activities occurs near land uses that have already been developed (and where people are already living or working) within the SPA. In addition, because the SMAQMD's significance thresholds approximately correlate with reductions from heavy-duty vehicles and reduction requirements for land use project emissions in the SIP, construction-generated emissions could also conflict with air quality planning efforts. This would be a **direct significant** impact. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: Implement Mitigation Measure 3.2-1a.

Mitigation Measure 3.2-1b: Pay Off-Site Mitigation Fee to SMAQMD to Offset NO_X Emissions Generated by Construction Activities.

Because implementation of the Proposed Project, Biological Impact Minimization, Conceptual Strategy, or Increased Development Alternative would result in construction-generated NO_X emissions that exceed the SMAQMD threshold of significance, even after implementation of the SMAQMD Enhanced Exhaust Control Practices (listed in Mitigation Measure 3.2-1a), the project applicants shall pay SMAQMD an off-site mitigation fee for implementation of the Proposed Project, Biological Impact Minimization, Conceptual Strategy, or the Increased Development Alternatives for the purpose of reducing NO_X emissions to a level that is less than 85 lb/day as required by SMAQMD and described further below.

- The specific fee amounts shall be calculated when the daily construction emissions (after implementation of Mitigation Measure 3.2-1a) can be more accurately determined; that is, if the City certifies the EIR and approves the project and USACE issues a record of decision on either the Proposed Project, Biological Impact Minimization, Conceptual Strategy, or the Increased Development Alternatives. At that point, the City and the project applicants shall develop a detailed construction schedule. Calculation of fees associated with each project development phase shall be

conducted by the project applicant in consultation with SMAQMD staff before the approval of grading plans by the City.

- The calculation of daily NO_X emissions shall be based on the cost rate established by SMAQMD at the time the calculation and payment are made.

- At the time of writing this EIR/EIS the current mitigation fee rate is $16,400 per ton of emissions (as of July 1, 2010) plus a 5% administrative fee (SMAQMD 2010b). The determination of the final mitigation fee shall be conducted in coordination with SMAQMD before any ground disturbance occurs for any project phase. Based on information available at the time of writing this EIR/EIS, and assuming that construction would be performed at a consistent rate over a 20-year period (and averaging of 22 work days per month for six months), it is estimated that the off-site construction mitigation fees would range from $1,136 to $35,232 per year, depending on which alternative is selected. These estimates were obtained by multiplying tons in excess of the 85 lb/day NO_x threshold for the lowest and highest emitting alternatives (i.e. 0.0005 tons/day for the BIM alternative, and 0.016 tons/day for the ID alternative) by $16,400/ton, and further multiplying by 22 workdays per month, six months per year; these numbers were then multiplied by 5%, and summed with the previous figure to obtain total annual costs. The mitigation fee is based on the mass quantity of emissions that exceed SMAQMD's daily threshold of significance of 85 lb/day, therefore, the total fees would be substantially greater if construction activity is more intense during some phases and less intense during other phases of the 19-year build out period, and in any event, based on the actual cost rate applied by SMAQMD. Since the fees will be estimated and paid before the grading permit is issued, the applicant may not pay enough for mitigation, or pay too much, and a final adjustment will be made post-construction. (This fee is used by SMAQMD to fund cost-effective projects that reduce NO_x and/or $PM_{2.5}$ in the project study area, to the extent possible, and otherwise within the Sacramento Valley Air Basin.)

Mitigation Measure: Implement Portions of Mitigation Measure 3.4-1.

The project applicants for any particular discretionary development application shall implement the following submeasures from Mitigation Measure 3.4-1, which would also reduce construction-related criteria pollutant emissions:

- Improve fuel efficiency from construction equipment by using equipment with new technologies (repowered engines, electric drive trains).

- Use alternative fuels for electricity generators and welders at construction sites such as propane or solar, or use electrical power.

- Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.

- Use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, sidewalk and curb materials).

- Use EPA-certified SmartWay trucks for deliveries and equipment transport. Additional information about the SmartWay Transport Partnership Program is available from ARB's Heavy-Duty Vehicle Greenhouse Gas Measure (ARB 2009c) and EPA (2009).

In addition to reducing temporary and short-term construction-related GHGs, implementation of Mitigation Measure 3.4-1 would further reduce construction-related emissions of NO_X and PM, but the reductions are not quantifiable because the reduction in the direct and indirect emissions of these

pollutants due to some displacement of conventional equipment, materials, and material and worker transport-related VMT is unknown at the time of writing this DEIR/DEIS.

Implementation: The project applicants for any particular discretionary development application.

Timing: Before the approval of all grading plans by the City and throughout project construction for all project phases.

Enforcement: The City of Rancho Cordova Community Development Department shall not grant any grading permits to the respective project applicant until the respective project applicant has paid the appropriate off-site mitigation fee to SMAQMD.

ID

Predicted temporary and short-term construction-generated emissions were modeled as discussed in the Analysis Methodology section and results are presented in Table 3.2-4, above. It is possible that the ground-disturbing activities associated with site construction could result in concentrations of PM_{10} and $PM_{2.5}$ that exceed the significance thresholds.

The maximum daily level of construction-generated NO_X emissions under the Increased Development Alternative would substantially exceed the SMAQMD-recommended threshold of 85 lb/day. Because mass emissions of NO_X would exceed SMAQMD's recommended threshold of significance of 85 lb/day, construction-generated emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation. Also, construction emissions of criteria air pollutants and precursors could expose sensitive receptors to substantial pollutant concentrations, particularly when grading and other ground disturbance activities occurs near land uses that have already been developed (and where people are already living or working) within the SPA. In addition, because the SMAQMD's significance thresholds approximately correlate with reductions from heavy-duty vehicles and reduction requirements for land use project emissions in the SIP, construction-generated emissions could also conflict with air quality planning efforts. This would be a **direct significant** impact. **No indirect** impacts would occur. ***[Greater]***

Mitigation Measure: Implement Mitigation Measures 3.2-1a, 3.2-1b, and 3.4-1a.

Implementation of Mitigation Measure 3.2-1a would reduce NO_X emissions resulting from construction of the No USACE Permit Alternative to levels that would not violate SMAQMD's threshold of significance of 85 lbs/day by implementing SMAQMD's Basic Construction Emission Control Practices and Enhanced Exhaust Control Practices (NO_X reduction of 20%); therefore, this impact as related to NO_X would be **less than significant** under the No USACE Permit Alternative. SMAQMD addresses construction-related emissions of ROG through the implementation of District Rule 442, which regulates ROG emissions from architectural coatings. With application of this rule, ROG impacts of the No USACE Permit Alternative would be **less than significant**.

With regard to NO_X emissions associated with construction of on-site elements under the Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives, implementation of SMAQMD's Basic Construction Emission Control Practices and Enhanced Exhaust Control Practices, as required by Mitigation Measure 3.2-1a (NO_X reduction of 20%) would reduce the emissions of NO_X, but not to a level that is below the SMAQMD's threshold of 85 lb/day. However, SMAQMD considers that payment of an off-site mitigation fee to offset the remaining construction-generated NO_X emissions, as required by Mitigation Measure 3.2-1b, would reduce the impact to a level that SMAQMD considers less than significant. Consequently, emissions of NO_X associated with the construction of the Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives would be reduced to a **less-than-significant** level following implementation of Mitigation Measures 3.2-1a and 3.2-1b. SMAQMD addresses construction-related emissions of ROG through the implementation of District Rule 442, which regulates ROG emissions from

architectural coatings. With application of this rule, ROG impacts of the Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives would be **less than significant**.

With regard to PM_{10} and $PM_{2.5}$ emission concentrations resulting from construction of the SPA, implementation of SMAQMD's Basic Construction Emission Control Practices, Enhanced Fugitive PM Dust Control Practices for Soil Disturbance Areas, and Enhanced Fugitive PM Dust Control Practices for Unpaved Roads, as required by Mitigation Measures 3.2-1a and portions of 3.4-1, would reduce PM_{10} and $PM_{2.5}$ concentrations generated during the construction of the on-site elements by up to 75% (SMAQMD 2009).

Mitigation Measure 3.2-1a would reduce temporary and short-term construction emissions during buildout. SMAQMD maintains a standard list of mitigation measures to address exhaust emissions and fugitive dust, as well as "enhanced" exhaust control measures that are specifically designed to address construction-related emissions. In addition, Mitigation Measure 3.2-1a requires compliance with additional feasible mitigation measures that may be recommended by SMAQMD at the time that projects in the SPA are proposed for construction. Finally, the mitigation requires compliance with applicable rules and regulations that are maintained by SMAQMD to address construction-related effects. After the analysis that was conducted to support this EIR/EIS was prepared, SMAQMD revised its recommendations for significance thresholds for PM_{10} and $PM_{2.5}$ to include concentration-based thresholds, which are the same as those provided in the CAAQS. SMAQMD assumes that if construction emissions do not exceed the PM_{10} threshold, then they would also not exceed the $PM_{2.5}$ threshold. SMAQMD further assumes that projects would not exceed the concentration based thresholds if they implement all Basic Construction Emission Control Practices and the maximum daily disturbed would not exceed 15 acres (SMAQMD 2009). Since applicant has stated that it cannot limit the area disturbed by construction for this project to 15 acres per day, the City cannot demonstrate at this time that the project would not contribute to an exceedance of the concentration based PM thresholds. Therefore, the City conservatively assumes that PM_{10} and $PM_{2.5}$ emissions associated with construction of the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives would be **significant and unavoidable**.

IMPACT 3.2-2 **Generation of Long-Term Operational (Regional) Emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$.** *Operational area- and mobile-source emissions from project implementation would exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, and would result in or substantially contribute to emissions that lead to exceedances of the NAAQS or CAAQS for ozone. Operational area- and mobile-source emissions of PM_{10} and $PM_{2.5}$ could substantially contribute to emissions concentrations that lead to exceedances of the NAAQS or CAAQS for PM_{10} and $PM_{2.5}$. Therefore, project implementation could potentially violate or contribute substantially to an existing or projected air quality violation and conflict with air quality planning efforts in the SVAB.*

NP

Because the project would not be implemented under the No Project Alternative, **no direct** or **indirect** project-related impacts would occur related to long-term operational emissions of ROG, and NO_X. ***[Lesser]***

NCP

Operation of the No USACE Permit Alternative would result in long-term regional emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with area sources, such as natural gas emissions, landscaping, and applications of architectural coatings, in addition to operational vehicle-exhaust emissions.

Hearth emissions were presumed to be associated with 100% natural gas combustion, per the project applicants. According to the traffic data used in this EIR/EIS, full buildout of the No USACE Permit Alternative would result in approximately 49,170 additional vehicle trips per day and a regional net increase of 364,289 VMT per day

(Fehr & Peers 2010). Operational emissions were modeled using the URBEMIS 2007 Version 9.2.4 computer program (Rimpo and Associates 2008), as recommended by SMAQMD. Model defaults were adjusted to reflect project-specific data, where available, including the sizes and types of proposed land uses. Modeled operational emissions for the No USACE Permit Alternative are presented in Table 3.2-5. Refer to Appendix L for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs.

Table 3.2-5
Summary of Modeled Long-Term Operational Emissions Under the No USACE Permit Alternative

Source	Emissions (lb/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Operational Sources[1]				
Mobile-Source Emissions	145	141	575	109
Area-Source Emissions	263	79	2	2
Total Unmitigated Operational Emissions	408	220	577	111
SMAQMD Significance Threshold	65	65	50 µg/m^3 24-hour standard; 20 µg/m^3 Annual Arithmetic Mean[2]	12 µg/m^3 Annual Arithmetic Mean[2]

Notes: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; SMAQMD = Sacramento Metropolitan Air Quality Management District; µg/m^3 = micrograms per cubic meter
See Appendix L for modeling assumptions and results.

[1] Operational emissions shown represent the maximum daily emissions during the summertime or wintertime in year 2030. Totals may not add exactly due to rounding.

[2] SMAQMD has not identified mass emissions thresholds for operational emissions of PM_{10} or $PM_{2.5}$. These concentration based thresholds were developed after the analysis for this EIR/EIS was completed using mass emissions data, and are reported here for disclosure purposes. SMAQMD's concentration-based thresholds for PM are based on the California ambient air quality standards (CAAQS). Operational PM emissions would only cause "hot spot" violations of the national ambient air quality standards (NAAQS) or the CAAQS under unusual circumstances that are not anticipated in the proposed project or project alternatives, i.e., in the vicinity of large quantities of unpaved road dust (PM_{10}) or diesel or other combustion sources, such as large food smokers or grills ($PM_{2.5}$). According to SMAQMD, "land use development projects do not typically have the potential to result in localized concentrations of CAPs [Criteria Air Pollutants] that exceed or contribute to an exceedance of the respective AAQS…because CAPs are predominantly generated in the form of mobile-source exhaust from vehicle trips associated with the land use development project. These vehicle trips occur throughout a paved network of roads, and, therefore, associated exhaust emissions of CAPs are not generated in a single location where high concentrations could be formed."

Source: Modeling performed by AECOM in 2010

Based on the modeling conducted, and as summarized in Table 3.2-5, operation of the No USACE Permit Alternative would result in a net increase in unmitigated long-term regional emissions of approximately 408 lb/day of ROG, 220 lb/day of NO_X, 577 lb/day of PM_{10}, and 111 lb/day of $PM_{2.5}$. Operational area- and mobile-source emissions of NO_X from implementation of the No USACE Permit Alternative would exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, and would result in or substantially contribute to emissions concentrations that exceed the NAAQS or CAAQS for ozone and secondary formation of $PM_{2.5}$.

Operational PM emissions would only cause "hot spot" violations of the NAAQS or the CAAQS under unusual circumstances, i.e., in the vicinity of large quantities of unpaved road dust (PM_{10}) or diesel or other combustion sources such as large food smokers or grills ($PM_{2.5}$). However, direct, operational PM emissions associated with the project could substantially contribute to increases in regional PM, especially $PM_{2.5}$, which is not as easily removed from the atmosphere as PM_{10}.

Although the project is not specifically included in the *Ozone Attainment and Reasonable Further Progress Plan* (SMAQMD 2008a), the plan uses emissions based on the Metropolitan Transportation Plan's (MTP's) land use

assumptions, which allocated medium-density mixed residential to the southeast arm of Rancho Cordova. Since the SPA is planned for buildout of similar land uses, some similar emissions estimates were included in the plan.

Because development of the SPA is included in the City's General Plan, operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land use development on the site are already accounted for to some degree in the applicable air quality plans. However, implementation of the No USACE Permit Alternative could still potentially conflict with air quality planning efforts in the SVAB. As a result, this long-term **direct** impact is considered **significant**. **No indirect** impacts would occur. ***[Lesser]***

Mitigation Measure 3.2-2: Implement All Measures Prescribed by the Air Quality Mitigation Plan to Reduce Operational Air Pollutant Emissions.

To reduce operational emissions under the No USACE Permit Alternative, the project applicants for any particular discretionary development application shall implement all measures prescribed in the SMAQMD-approved *SunCreek Specific Plan 15 Point Air Quality Mitigation Plan* (AQMP) (AECOM 2010), a copy of which is included in Appendix M. The AQMP is intended to improve mobility, reduce VMT, and improve air quality.

Implementation: The project applicants for any particular discretionary development application.

Timing: Before issuance of subdivision maps or improvement plans.

Enforcement: City of Rancho Cordova Community Development Department in consultation with the Sacramento Metropolitan Air Quality Management District.

PP

According to the traffic data used for this EIR/EIS, full buildout of the Proposed Project Alternative would result in approximately 96,303 additional vehicle trips per day and a regional net increase of 622,868 VMT per day (Fehr & Peers 2010).

Modeled operational emissions for the Proposed Project Alternative are presented in Table 3.2-6. Refer to Appendix L for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs.

Operational PM emissions would only cause "hot spot" violations of the NAAQS or the CAAQS under unusual circumstances that are not anticipated in the Proposed Project or and of the project alternatives, i.e., in the vicinity of large quantities of unpaved road dust (PM^{10}) or diesel or other combustion sources, such as large food smokers or grills ($PM^{2.5}$). The City does not anticipate these unusual circumstances to occur in the SPA. According to SMAQMD, "land use development projects do not typically have the potential to result in localized concentrations of CAPs [Criteria Air Pollutants] that exceed or contribute to an exceedance of the respective AAQS…because CAPs are predominantly generated in the form of mobile-source exhaust from vehicle trips associated with the land use development project. These vehicle trips occur throughout a paved network of roads, and, therefore, associated exhaust emissions of CAPs are not generated in a single location where high concentrations could be formed." Concentration-based PM thresholds would not be exceeded.

Based on the modeling conducted, and as summarized in Table 3.2-6, operation of the Proposed Project Alternative would result in a net increase in unmitigated long-term regional emissions of approximately 523 lb/day of ROG, 335 lb/day of NO_X, 961 lb/day of PM_{10}, and 185 lb/day of $PM_{2.5}$. Operational area- and mobile-source emissions of NO_X from implementation of the Proposed Project Alternative would exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, which could result in or substantially contribute to emissions concentrations that exceed the NAAQS or CAAQS. Because development of the SPA is included in the City's General Plan, operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land use development on the site are already accounted for to some degree in the applicable air quality plans. However,

implementation of the Proposed Project Alternative could still potentially conflict with air quality planning efforts in the SVAB.

Table 3.2-6
Summary of Modeled Long-Term Operational Emissions Under the Proposed Project Alternative

Source	Emissions (lb/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Operational Sources[1]				
Mobile-Source Emissions	256	239	959	183
Area-Source Emissions	267	96	2	2
Total Unmitigated Operational Emissions	523	335	961	185
SMAQMD Significance Threshold	65	65	50 $\mu g/m^3$ 24-hour standard; 20 $\mu g/m^3$ Annual Arithmetic Mean[2]	12 $\mu g/m^3$ Annual Arithmetic Mean[2]

Notes: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; SMAQMD = Sacramento Metropolitan Air Quality Management District; $\mu g/m^3$ = micrograms per cubic meter
See Appendix L for modeling assumptions and results.

[1] Operational emissions shown represent the maximum daily emissions during the summertime or wintertime in year 2030. Totals may not add exactly due to rounding.

[2] SMAQMD has not identified mass emissions thresholds for operational emissions of PM_{10} or $PM_{2.5}$. Emission levels are shown for informational purposes only. See footnote 2 in Table 3.2-5 for additional detail.

Source: Modeling performed by AECOM in 2010

As a result, this long-term **direct** impact is considered **significant**. **No indirect** impacts would occur.

Mitigation Measure: Implement Mitigation Measure 3.2-2.

BIM

According to the traffic data used for this EIR/EIS, full buildout of the Biological Impact Minimization Alternative would result in approximately 45,954 additional vehicle trips per day and a regional net increase of 338,131 VMT per day (Fehr & Peers 2010). Modeled operational emissions for the Conceptual Strategy Alternative are presented in Table 3.2-7. Refer to Appendix L for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs.

Based on the modeling conducted, and as summarized in Table 3.2-7, operation of the Biological Impact Minimization Alternative would result in a net increase in unmitigated long-term regional emissions of approximately 386 lb/day of ROG, 217 lb/day of NO_X, 574 lb/day of PM_{10}, and 111 lb/day of $PM_{2.5}$. Operational area- and mobile-source emissions of NO_X from implementation of the Biological Impact Minimization Alternative would exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, which could result in or substantially contribute to emissions concentrations that exceed the NAAQS or CAAQS. Because development of the SPA is included in the City's General Plan, operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land use development on the site are already accounted for to some degree in the applicable air quality plans. However, implementation of the Biological Impact Minimization Alternative could still potentially conflict with air quality planning efforts in the SVAB. As a result, this long-term **direct** impact is considered **significant**. **No indirect** impacts would occur. ***[Lesser]***

Mitigation Measure: Implement Mitigation Measure 3.2-2.

Table 3.2-7
Summary of Modeled Long-Term Operational Emissions Under the Biological Impact Minimization Alternative

Source	Emissions (lb/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Operational Sources[1]				
Mobile-Source Emissions	141	139	572	109
Area-Source Emissions	245	78	2	2
Total Unmitigated Operational Emissions	386	217	574	111
SMAQMD Significance Threshold	65	65	50 $\mu g/m^3$ 24-hour standard; 20 $\mu g/m^3$ Annual Arithmetic Mean[2]	12 $\mu g/m^3$ Annual Arithmetic Mean[2]

Notes: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; SMAQMD = Sacramento Metropolitan Air Quality Management District; $\mu g/m^3$ = micrograms per cubic meter
See Appendix L for modeling assumptions and results.

[1] Operational emissions shown represent the maximum daily emissions during the summertime or wintertime in year 2030. Totals may not add exactly due to rounding.

[2] SMAQMD has not identified mass emissions thresholds for operational emissions of PM_{10} or $PM_{2.5}$. Emission levels are shown for informational purposes only. See footnote 2 in Table 3.2-5 for additional detail

Source: Modeling performed by AECOM in 2010

CS

According to the traffic data used for this EIR/EIS, full buildout of the Conceptual Strategy Alternative would result in approximately 61,210 additional vehicle trips per day and a regional net increase of 371,489 VMT per day (Fehr & Peers 2010). Modeled operational emissions for the Conceptual Strategy Alternative are presented in Table 3.2-8. Refer to Appendix L for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs.

Table 3.2-8
Summary of Modeled Long-Term Operational Emissions Under the Conceptual Strategy Alternative

Source	Emissions (lb/day) [1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Operational Sources [1]				
Mobile-Source Emissions	179	172	701	134
Area-Source Emissions	261	85	2	2
Total Unmitigated Operational Emissions	440	257	703	136
SMAQMD Significance Threshold	65	65	50 $\mu g/m^3$ 24-hour standard; 20 $\mu g/m^3$ Annual Arithmetic Mean[2]	12 $\mu g/m^3$ Annual Arithmetic Mean[2]

Notes: lb/day = pounds per day; $\mu g/m^3$ = micrograms per cubic meter; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; SMAQMD = Sacramento Metropolitan Air Quality Management District
See Appendix L for modeling assumptions and results.

[1] Operational emissions shown represent the maximum daily emissions during the summertime or wintertime in year 2030. Totals may not add exactly due to rounding.

[2] SMAQMD has not identified mass emissions thresholds for operational emissions of PM_{10} or $PM_{2.5}$. Emission levels are shown for informational purposes only. See footnote 2 in Table 3.2-5 for additional detail.

Source: Modeling performed by AECOM in 2010

Based on the modeling conducted, and as summarized in Table 3.2-8, operation of the Conceptual Strategy Alternative would result in a net increase in unmitigated long-term regional emissions of approximately 440 lb/day of ROG, 257 lb/day of NO_X, 703 lb/day of PM_{10}, and 136 lb/day of $PM_{2.5}$. Operational area- and mobile-source emissions of NO_X from implementation of the Conceptual Strategy Alternative would exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, which could result in or substantially contribute to emissions concentrations that exceed the NAAQS or CAAQS.

Because development of the SPA is included in the City's General Plan, operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land use development on the site are already accounted for to some degree in the applicable air quality plans. However, implementation of the Conceptual Strategy Alternative could still potentially conflict with air quality planning efforts in the SVAB. As a result, this long-term **direct** impact is considered **significant**. **No indirect** impacts would occur. ***[Lesser]***

Mitigation Measure: Implement Mitigation Measure 3.2-2.

ID

According to the traffic data used for this EIR/EIS, full buildout of the Increased Development Alternative would result in approximately 72,878 additional vehicle trips per day and a regional net increase of 444,627 VMT per day (Fehr & Peers 2010). Modeled operational emissions for the Increased Development Alternative are presented in Table 3.2-9. Refer to Appendix L for a detailed summary of the URBEMIS modeling assumptions, inputs, and outputs.

Based on the modeling conducted, and as summarized in Table 3.2-9, operation of the Increased Development Alternative would result in a net increase in unmitigated long-term regional emissions of approximately 386 lb/day of ROG, 217 lb/day of NO_X, 574 lb/day of PM_{10}, and 111 lb/day of $PM_{2.5}$. Operational area- and mobile-source emissions of NO_X from implementation of the Increased Development Alternative would exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, and would result in or substantially contribute to emissions concentrations that exceed the NAAQS or CAAQS.

Table 3.2-9
Summary of Modeled Long-Term Operational Emissions Under the Increased Development Alternative

Source	Emissions (lb/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Operational Sources[1]				
Mobile-Source Emissions	141	139	572	109
Area-Source Emissions	245	78	2	2
Total Unmitigated Operational Emissions	386	217	574	111
SMAQMD Significance Threshold	65	65	50 $\mu g/m^3$ 24-hour standard; 20 $\mu g/m^3$ Annual Arithmetic Mean[2]	12 $\mu g/m^3$ Annual Arithmetic Mean[2]

Notes: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; SMAQMD = Sacramento Metropolitan Air Quality Management District; $\mu g/m^3$ = micrograms per cubic meter
See Appendix L for modeling assumptions and results.

[1] Operational emissions shown represent the maximum daily emissions during the summertime or wintertime in year 2030. Totals may not add exactly due to rounding.

[2] SMAQMD has not identified mass emissions thresholds for operational emissions of PM_{10} or $PM_{2.5}$. Emission levels are shown for informational purposes only. See footnote 2 in Table 3.2-5 for additional detail.

Source: Modeling performed by AECOM in 2010

Because development of the SPA is included in the City's General Plan, operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land use development on the site are already accounted for to some degree in the applicable air quality plans. However, implementation of the Increased Development Alternative could still potentially conflict with air quality planning efforts in the SVAB. As a result, this long-term **direct** impact is considered **significant**. **No indirect** impacts would occur. ***[Lesser for ROG and NO_x, Greater for PM_{10} and $PM_{2.5}$]***

Mitigation Measure: Implement Mitigation Measure 3.2-2.

Implementation of the SMAQMD-approved SunCreek Specific Plan 15 Point Air Quality Mitigation Plan would substantially reduce PM_{10}, and $PM_{2.5}$ emissions. For this project, PM emissions are predominantly attributable to mobile sources and will be distributed throughout a large area via trips generated by, and attracted to, the SPA. Operational PM emissions would only cause "hot spot" violations of the NAAQS or the CAAQS under unusual circumstances, i.e., in the vicinity of large quantities of unpaved road dust (PM_{10}) or diesel or other combustion sources, such as large food smokers or grills ($PM_{2.5}$). The City does not anticipate these unusual circumstances to occur in the SPA. According to SMAQMD, "land use development projects do not typically have the potential to result in localized concentrations of CAPs [Criteria Air Pollutants] that exceed or contribute to an exceedance of the respective AAQS…because CAPs are predominantly generated in the form of mobile-source exhaust from vehicle trips associated with the land use development project. These vehicle trips occur throughout a paved network of roads, and, therefore, associated exhaust emissions of CAPs are not generated in a single location where high concentrations could be formed." (SMAQMD 2009) Impacts related to PM_{10}, and $PM_{2.5}$ concentrations for the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives are considered **less than significant with mitigation**.

Implementation of all air pollutant reduction measures contained in the SMAQMD-approved AQMP, as required by Mitigation Measure 3.2-2, would reduce ROG and NO_X emissions associated with operation of the project, but not to a less-than-significant level. However, for reasons described in more detail below, the exact reduction achieved by implementation of Mitigation Measure 3.2-2 cannot be determined for the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives.

While the AQMP was developed to achieve a 15% reduction in operational NO_X emissions from baseline levels, based on the traffic study, the baseline levels are not represented by the URBEMIS modeling output summarized in Tables 3.2-5 through 3.2-9 (above). For the purposes of developing an AQMP pursuant to SMAQMD's *Guidance for Land Use Emission Reductions* (SMAQMD 2007), a baseline emissions level is presumed that is based on standard default trip generation rates established by the Institution of Transportation Engineers (ITE). The traffic modeling performed to support the modeling of operational emissions summarized in Tables 3.2-5 through 3.2-9 of this section, did not use standard ITE trip generation rates. Instead, the traffic analysis was based on a modified version of the 2008 SACMET regional travel demand forecasting model (Fehr & Peers 2010).

By incorporating more parameters that are unique to the region and the SPA, the model estimates more precise (and lower) estimates of VMT than using standard default ITE trip generation rates, which in turn results in more precise (and lower) estimates of operational air pollutant emissions. In other words, the traffic modeling already accounts for some of the unique attributes of the alternative land use plans (such as the proximity of residential and commercial land uses to activity centers and to transit service), for which an emissions reduction is also included in the AQMP. Therefore, one would overestimate the reduction achieved by the AQMP by reducing the levels of operational NO_X emissions reported in Tables 3.2-5 through 3.2-9 by 15%. The actual emission reduction benefit of the AQMP would be some amount less than 15%. Nonetheless, even if operational emissions of ROG and NO_X were 15% lower than the levels reported in Tables 3.2-5 through 3.2-9, they would still exceed SMAQMD's significance threshold of 65 lb/day. Implementation of the AQMP would not reduce long-term operational impacts of the project to a less-than-significant level. As a result, this impact would be **significant and unavoidable**.

IMPACT 3.2-3 **Creation of Carbon Monoxide (CO) "Hot Spots".** *Project implementation would not result in the creation of CO Hot Spots from mobile sources.*

NP

Because the project would not be implemented under the No Project Alternative, **no direct** or **indirect** project-related impacts would occur related to creation of CO hot spots from mobile sources. ***[Lesser]***

NCP, PP, BIM, CS, ID

Under all five action alternatives, the localized impacts associated with CO emissions from on- and off-site operational mobile sources would be similar and are each discussed below.

SMAQMD has developed a preliminary screening methodology to provide a conservative indication of whether project-generated vehicle trips would result in CO emissions that contribute to an exceedance of the NAAQS or CAAQS. SMAQMD's recommended screening criteria are divided into two tiers, as described below.

First Tier

The project would result in a less-than-significant impact to air quality for local CO if:

- traffic generated by the project would not result in deterioration of intersection level of service (LOS) to LOS E or F; or
- the project would not contribute additional traffic to an intersection that already operates at LOS of E or F.

If the first tier of screening criteria is not met then the second tier of screening criteria shall be examined.

Second Tier

If all of the following criteria are met, the project would result in a less-than-significant impact to air quality for local CO:

- the project would not result in an affected intersection experiencing more than 31,600 vehicles per hour;
- the project would not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway; or other locations where horizontal or vertical mixing of air would be substantially limited; and
- the mix of vehicle types at the intersection is not anticipated to be substantially different from the County average (as identified by the EMFAC or URBEMIS models).

Because several intersections in the project vicinity would deteriorate to LOS E due to project implementation, and several intersections currently operate at LOS F, the project does not meet the first tier screening criteria and therefore the second tier criteria must be examined.

The intersection traffic volumes associated with buildout of all five action alternatives do not approach the second tier screening value of 31,600 vehicles per hour (the highest intersection traffic is 7,860 vehicles per hour on Sunrise Boulevard from Gold Country Boulevard to Coloma Road; see Section 3.15, "Traffic and Transportation" and Appendix L for details). Additionally, the project would not contribute traffic to a location with limited

horizontal or vertical mixing. Lastly, the mix of vehicle types added to any intersection under any of the five action alternatives would not be substantially different from the County average; in particular, none of the five action alternatives is anticipated to add substantial numbers of medium or heavy gas-powered vehicles with higher CO emissions than would be expected from an average fleet mix.

In conclusion, none of the five action alternatives violate any of SMAQMD's second tier screening criteria for CO hot spot generation. Therefore, mobile source CO emissions associated with implementation of the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternative would not cause localized exceedances of the NAAQS or CAAQS, and this long-term **direct** impact is considered **less than significant**. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

IMPACT 3.2-4 **Exposure of Sensitive Receptors to Temporary and Short-, and Long-Term Emissions of Toxic Air Contaminants.** *Project implementation would result in exposure of receptors to temporary and short-, and long-term emissions of TACs from on-site stationary and mobile sources and from off-site mobile sources.*

NP

Because the project would not be implemented under the No Project Alternative, **no direct** or **indirect** project-related impacts would occur related to exposures of sensitive receptors to short- and long-term emissions of TACs. ***[Lesser]***

NCP, PP, BIM, CS, ID

Under all five action alternatives, the TAC impacts associated with exposure of sensitive receptors to temporary and short-term emissions from construction equipment, long-term stationary-source emissions, emissions from on-site operational mobile sources, and land use compatibility with neighboring roads would be similar and are each discussed below.

Temporary and Short-Term Emissions from Construction Equipment

Construction of the project would result in temporary and short-term emissions of diesel exhaust from on-site heavy-duty equipment. Diesel particulate matter was identified as a TAC by ARB in 1998. Construction of the project would result in the generation of DPM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities. According to ARB, the potential cancer risk from the inhalation of DPM, which is discussed below, outweighs the potential noncancer health impacts (ARB 2003).

The dose to which the receptors are exposed (a function of concentration and duration of the exposure period) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). According to OEHHA, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project.

The use of mobilized equipment in each area of the SPA would be temporary. In addition, some new residents would occupy the site concurrently with on-site construction activities. Thus, DPM from construction activities could also expose on-site residents and schools to levels that exceed applicable standards as some phases of the development plan are built out while construction of other phases continues. Particularly, some residents may be exposed to DPM generated by construction activity in all directions (at varying times). Additionally, adjacent, off-site sensitive receptors could be exposed to construction activities occurring within the SPA. Even with the

dispersive properties of DPM (Zhu et al. 2002), construction activities could expose sensitive receptors to levels of health risk that exceed applicable standards. Therefore, this **direct** impact is considered **potentially significant**. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: Implement Mitigation Measures 3.2-1a and 3.4-1a.

Emissions from On-Site Operational Stationary-Sources

No stationary sources of TAC emissions are located on or immediately adjacent to the SPA.

Long-term operation of on-site commercial uses would likely include the installation of stationary sources of TACs, such as dry cleaning establishments, gasoline-dispensing facilities, diesel-fueled backup generators, and/or restaurants using charbroilers. These and other types of stationary sources may also be developed at off-site locations near the SPA in future years. All stationary sources that may emit TACs would be subject to SMAQMD permitting regulations and T-BACT requirements. Pursuant to SMAQMD Regulation 2 (Permit Requirements) and Rule 904 (Air Toxic Control Measures) SMAQMD would analyze such sources (e.g., in a health risk assessment) based on their potential to emit TACs.

If it is determined that the sources would emit TACs in excess of SMAQMD's applicable threshold of significance, T-BACT would be implemented to reduce emissions. If the implementation of T-BACT would not reduce the risk below the applicable threshold, then SMAQMD would deny the required permit.

As a result, operation of any stationary sources would not result in the exposure of sensitive receptors to TACs at levels exceeding SMAQMD's significance thresholds. Therefore, this **direct** impact is considered **less than significant. No indirect** impact would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

Emissions from On-Site Operational Mobile Sources

Project development would include residences, schools, and parks. Because of the sensitivity of such uses, assessment of compatibility of surrounding land uses with respect to sources of TAC emissions is required.

On-site mobile sources of TACs would primarily be associated with the operation of school buses transporting students to and from the proposed schools, as well as diesel-powered delivery trucks associated with proposed on-site commercial activities.

Emissions from school buses can vary, depending on various factors, including bus type, age, maintenance, and amount of time spent idling. Health impacts from exhaust exposure include eye and respiratory irritation, enhanced respiratory allergic reactions, asthma exacerbation, increased cancer risk, and immune system degradation. Generally, children are more vulnerable to air pollutants because of higher inhalation rates, narrower airways, and less mature immune systems.

In response to the above issue, the ARB adopted an ATCM as part of the Particulate Matter Risk Reduction Plan to specifically deal with diesel emissions from school buses. This ATCM became effective July 16, 2003. The school bus idling ATCM includes the following requirements:

(a) The driver of a school bus or vehicle, transit bus, or heavy-duty vehicle (other than a bus) shall manually turn off the bus or vehicle upon arriving at a school and restart no more than 30 seconds before departing. A driver of a school bus or vehicle shall be subject to the same requirement when operating within 100 feet of a school and shall be prohibited from idling more than 5 minutes at each stop beyond schools, such as parking or maintenance facilities, school bus stops, or school activity destinations. A driver of a transit bus or heavy-duty

vehicle (other than a bus) shall be prohibited from idling more than 5 minutes at each stop within 100 feet of a school. Idling necessary for health, safety, or operational concerns shall be exempt from these restrictions.

(b) The motor carrier of the affected bus or vehicle shall ensure that drivers are informed of the idling requirements, track complaints and enforcement actions, and keep track of driver education and tracking activities.

According to ARB, implementation of the above requirements would eliminate unnecessary idling for school buses and other heavy-duty vehicles, protecting children from unhealthful exhaust emissions and thus reducing localized exposure to TACs and other harmful air pollution emissions at and near schools.

On-site operational mobile sources of TAC emissions would also be associated with the operation of diesel-powered delivery trucks at the loading docks and delivery areas of commercial land uses. Some sensitive land uses within the SPA would be located within 100 feet of commercial uses (e.g., local town center, commercial mixed use, and public/quasi-public land uses). Operational activities that require the use of diesel-fueled vehicles for extended periods, such as commercial trucking facilities, delivery/distribution areas, or loading docks, could expose nearby sensitive receptors to DPM emissions. The DPM emissions generated by these uses would be produced primarily at discrete locations on a regular basis. Idling trucks at these locations, including trailer refrigeration units (TRUs), could result in the exposure of nearby residents to increased DPM levels on a reoccurring basis.

As referenced above, the ARB's *Handbook* recommends avoiding the siting of new commercial trucking facilities that accommodate more than 100 trucks per day, or 40 trucks equipped with TRUs, within 1,000 feet of sensitive receptors (e.g., residences or schools) (ARB 2005). The number of trucks that would visit the facilities on any given day is not known at this time; however, based on the SunCreek Specific Plan (Appendix C), the types of commercial uses proposed for the SPA would not involve large-scale trucking operations. For the purposes of the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives, it is not anticipated that the combination of commercial land uses proposed in the SPA would exceed these screening limits.

In addition to the school bus idling ATCM, ARB also adopted an idling restriction ATCM for large commercial diesel-powered vehicles, which became effective February 1, 2005. In accordance with this measure, affected vehicles are required to limit idling to no longer than 5 minutes under most circumstances. ARB is also evaluating additional ATCMs intended to further reduce TACs associated with commercial operations, including a similar requirement to limit idling of smaller diesel-powered commercial vehicles.

Nonetheless, given that proposed on-site commercial and/or retail land uses for the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives have not yet been identified and could potentially involve substantial volumes of truck activity occurring in close proximity to nearby sensitive receptors, exposure of nearby on-site receptors to mobile-source TACs associated with commercial activities is considered a **direct** and **potentially significant** impact. **No indirect** impact would occur. ***[Similar]***

Mitigation Measure 3.2-4: Implement Measures to Reduce Exposure of Sensitive Receptors to Long-Term Operational Emissions of Toxic Air Contaminants.

- For every proposed commercial or retail land use within 1,000 feet of a sensitive land use that has the potential to emit TACs or host TAC-generating activity (e.g., loading docks, delivery areas that would accommodate more than 100 trucks per day, more than 40 trucks with operating TRUs per day, or where TRU unit operations exceed 300 hours per week), a HRA shall be performed by each individual project applicant to determine whether existing or proposed on-site sensitive receptors will be exposed to TAC emissions that exceed an incremental increase of 10 in 1 million for cancer risk and/or a noncarcinogenic Hazard Index (HI) of 1.0. If the results of the HRA indicate that the cancer

risk or HI exceeds the above-mentioned limits, the individual project applicant shall employ measures to reduce exposures to levels below the limits, which may include one or more of the following: Where necessary to reduce exposure of sensitive receptors to an incremental increase of 10 in 1 million for the cancer risk and/or a noncarcinogenic HI of 1.0, proposed commercial and industrial land uses that would host diesel trucks shall incorporate idle reduction strategies that reduce the main propulsion engine idling time through alternative technologies such as, IdleAire, electrification of truck parking, and alternative energy sources for TRUs, to allow diesel engines to be completely turned off.

- Signs shall be posted in at all loading docks and truck loading areas which indicate that diesel-powered delivery trucks must be shut off when not in use for longer than 5 minutes on the premises in order to reduce idling emissions. This measure is consistent with the ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling, which was approved by the California Office of Administrative Law in January 2005.

Implementation: The project applicants for any particular discretionary development application.

Timing: Before the approval of all grading plans by the City and throughout project construction, where applicable, for all project phases.

Enforcement: City of Rancho Cordova Community Development Department in consultation with the Sacramento Metropolitan Air Quality Management District.

Emissions from Off-Site Operational Mobile-Sources

As described previously, SMAQMD has developed a Protocol that provides a methodology for the assessment of potential cancer risk from DPM attributable to siting sensitive land uses adjacent to freeways and major roadways.

The first step in screening a project using the protocol is to determine if the nearest sensitive receptor affected by the project is at least 500 feet from the nearest high traffic volume roadway (defined as a freeway, urban roadway with greater than 100,000 vehicles/day, or rural roadway with 50,000 vehicles/day). If the project is outside of the 500 foot distance, then the project meets the ARB guidance distance and no further roadway-related air quality evaluations are recommended under the protocol.

Because none of the roadways within 500 feet of the SPA (Sunrise Boulevard, Kiefer Boulevard, Rancho Cordova Parkway, North Campus Drive, Chrysanthy Road, or Grant Line Road) approach average daily volumes of 100,000 vehicles per day under any of the five Action Alternatives (approximately 2,000—4,000 vehicles are expected during peak hour at the intersections mentioned above, see Section 3.15, "Traffic and Transportation" and Appendix L for details), the project screens out using SMAQMD's Protocol. Therefore, this **direct** impact is considered **less than significant**. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

Implementation of Mitigation Measures 3.2-1a and 3.4-1would reduce health-related risks associated with the use of off-road diesel powered equipment during construction activity under the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives by reducing DPM emissions. Therefore, the exposure of receptors to construction-generated TAC emissions is considered to be **less than significant**.

Implementation of Mitigation Measure 3.2-4 would reduce health-related risks associated with stationary on-site operational sources of TACs under the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives to a **less-than-significant** level because stationary sources of TACs must be permitted by SMAQMD and permit conditions are designed to avoid significant effects.

Implementation of Mitigation Measure 3.2-4 would reduce exposure of receptors to on-site mobile sources of TAC emissions within the SPA to a **less-than-significant** level by providing specific guidance for future analysis and mitigation measures based on types and locations of future commercial facilities and their proximity to sensitive receptors that is not known at the time of writing this DEIR/DEIS. In the future, as improvement plans and tentative subdivision map-level plans are prepared, depending on the types and locations of future commercial facilities and their proximity to sensitive receptors, the mitigation provided will direct actions to reduce impacts. The level of impact will also decrease since emissions of TACs are expected to decrease in future years and cleaner diesel technologies are implemented.

IMPACT 3.2-5 **Exposure of Sensitive Receptors to Temporary and Short-Term and Long-Term Odorous Emissions.** *Temporary and short-term construction and long-term operation of the project could result in the frequent exposure of sensitive receptors to substantial objectionable odor emissions.*

NP

Because the project would not be implemented under the No Project Alternative, **no direct** or **indirect** project-related impacts would occur related to exposures of sensitive receptors to short- and long-term emissions of TACs. ***[Lesser]***

NCP, PP, BIM, CS, ID

Possible Temporary and Short-Term On- and Off-Site Emissions from Construction Equipment

Project construction activities associated with the development of on-site land uses could result in odorous emissions from diesel exhaust generated by construction equipment. During some periods of the 20-year buildout of the project, intense levels of construction activity could potentially occur in close proximity to existing or future on-site sensitive receptors. Construction activity could potentially occur near on-site sensitive receptors for an extended period of time. In addition, existing or future residents in the existing or future residential neighborhoods located outside of, but adjacent to the SPA in Rancho Cordova, could be exposed to odorous diesel exhaust emissions generated by on-site construction activity. Because this activity could result in objectionable odors that could affect nearby sensitive receptors, this would be considered a **direct, significant** impact. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: Implement Mitigation Measures 3.2-1a and 3.4-1a.

Long-Term On-Site Operational Emissions

No common sources of nuisance odors, such as wastewater treatment facilities, waste disposal facilities, or agricultural operations, are proposed as part of the project. While there would be approximately 3 to 4 wastewater pumping stations located on the SPA, these facilities would have controls that would prevent the release of objectionable odors. In addition, the detention basins that would be located throughout the site would not typically hold storm water long enough for odor-generating anaerobic activity to occur. (See Chapter 2, "Alternatives," Appendix D, and Appendix I.) With regular maintenance and proper design, residential land uses are typically not considered a major source of odors.

Sensitive receptors could be exposed to on-site DPM, gasoline, and dry cleaning odors. Additionally, on-site sewer lift stations could intermittently emit diesel odors. Lastly, development of on-site commercial land uses could include retail or other uses that may include sources of odorous emissions (e.g., fast-food restaurants) that would be perceived as offensive to some individuals. The operation of such sources could expose on-site receptors to objectionable odorous emissions. As a result, this **direct** impact from long-term operational on-site odors would be considered **potentially significant**. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: Implement Mitigation Measure 3.2-4.

Mitigation Measure 3.2-5: Implement Measures to Control Exposure of Sensitive Receptors to On-Site Odorous Emissions.

The project applicants for any particular discretionary development application shall implement the following measures:

- For new project-generated odor-producing sources, sensitive receptors within the SPA shall be sited as far away as feasible from the new sources and the following shall also be implemented:

    - The odor-producing potential of land uses shall be considered when the exact type of facility that would occupy areas zoned for commercial or mixed land uses is determined. Facilities that have the potential to emit objectionable odors shall be located as far away as feasible from existing and proposed sensitive receptors.

    - Before the approval of building permits, odor control devices shall be identified to reduce the exposure of receptors to objectionable odors if a potential odor-producing source is to occupy an area zoned for commercial or mixed land uses. The identified odor control devices shall be installed before the issuance of certificates of occupancy for the potentially odor-producing use. The odor-producing potential of a source and control devices shall be determined in coordination with SMAQMD and based on the number of complaints associated with existing sources of the same nature.

    - Truck loading docks and delivery areas shall be located as far away as feasible from existing and proposed sensitive receptors.

    - Signs shall be posted at all loading docks and truck loading areas which indicate that diesel-powered delivery trucks must be shut off when not in use for longer than 5 minutes on the premises in order to reduce idling emissions. This measure is consistent with the ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling, which was approved by California's Office of Administrative Law in January 2005. (This measure is also required by Mitigation Measure 3.2-3b to limit TAC emissions.)

    - Proposed commercial land uses that have the potential to host diesel trucks shall incorporate idle reduction strategies that reduce the main propulsion engine idling time through alternative technologies such as, IdleAire, electrification of truck parking, and alternative energy sources for TRUs, to allow diesel engines to be completely turned off. (This measure is also required by Mitigation Measure 3.2-3b to limit TAC emissions.)

Implementation: The project applicants for any particular discretionary development application.

Timing: Before the approval of building permits by the City and throughout project construction, where applicable, for all project phases.

Enforcement: City of Rancho Cordova Community Development Department, in consultation with the Sacramento Metropolitan Air Quality Management District.

Implementation of Mitigation Measures 3.2-1a, 3.2-4, and 3.4-1 would reduce temporary and short-term emissions as well as operational mobile-source emissions of DPM, which in turn would reduce odors associated with the use of off-road diesel powered equipment during construction-related activities under the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives to a **less-than-significant** level.

Implementation of Mitigation Measure 3.2-5 would reduce odors associated with new on-site operational odor sources under the No USACE Permit, Proposed Project, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives to a **less-than-significant** level because odor-control devise would be installed, land uses would be sited to avoid placing sensitive receptors in close proximity to on-site odor emissions, and diesel trucks at commercial loading docks will be required to implement idle reduction controls.

IMPACT 3.2-6 **Need for Conformity Analysis and Conflicts with Federal Attainment Planning.** *Construction of the action alternatives would not conflict with attainment and implementation planning efforts related to Federal air quality standards for criteria air pollutants.*

NP, NCP, PP, BIM, CS, ID

In order to approve or permit projects, Federal agencies must demonstrate that the approved action does not interfere with applicable attainment planning for criteria air pollutants (42 U.S.C. Section 7506[c]). This assessment is known as conformity analysis or general conformity. SMAQMD adopted Federal conformity requirements as a part of the Air District's Rule 104. Conformity means:

> "(A) conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and
>
> (B) that such activities will not
>
> (i) cause or contribute to any new violation of any standard in any area;
>
> (ii) increase the frequency or severity of any existing violation of any standard in any area; or
>
> (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.
>
> The determination of conformity shall be based on the most recent estimates of emissions, and such estimates shall be determined from the most recent population, employment, travel and congestion estimates as determined by the metropolitan planning organization or other agency authorized to make such estimates (42 U.S.C. Section 7506[c][1]).

In order to determine whether conformity analysis is required, emissions of the action being considered are compared to "de minimis" thresholds that are established based on the severity of the nonattainment classification. The emissions considered are limited to those caused by the Federal action and over which the Federal agency will have control (40 CFR Section 51.852). For the SunCreek Specific Plan, this is limited to construction-related emissions. A conformity determination is required if emissions exceed de-minimis levels or account for 10% or more of a nonattainment or maintenance area's emissions inventory for the subject pollutant or precursor. The following de minimis levels apply to the Proposed Project and the other four action alternatives: NO_x—25 tons per year; VOC/ROG—25 tons per year; and PM_{10}—100 tons per year (40 CFR Section 93.153). A single year of construction activity was modeled (see Appendix L). As shown in Table 3.2-10, the projected annual emissions for the Proposed Project and the other four action alternatives would not exceed de-minimis levels. This would be a **less-than-significant**, **direct** impact. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

Table 3.2-10 Maximum Annual Construction-Related Emissions (Tons per Year)			
	VOC/ROG	NO_X	PM_{10}
De minimis thresholds	**25**	**25**	**100**
Action Alternative			
No USACE Permit Alternative	8.39	5.66	19.03
Proposed Project Alternative	10.66	8.63	28.69
Biological Impact Minimization Alternative	8.61	6..44	23.38
Conceptual Strategy Alternative	9.45	6.58	26.24
Increased Development Alternative	14.66	8.89	32.62

Notes: VOC = volatile organic compounds, ROG = reactive organic gases, NO_X = oxides of nitrogen, PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less.
Source: Modeled by AECOM in 2012

3.2.4 RESIDUAL SIGNIFICANT IMPACTS

Implementation of Mitigation Measure 3.2-1a would reduce temporary and short-term construction-related emissions of criteria air pollutants (PM_{10}), but not to less-than-significant levels, because emissions and exposure levels could potentially exceed applicable thresholds, and could substantially contribute to localized concentrations that exceed the NAAQS and CAAQS. Therefore, residual significant impacts may occur.

Implementation of Mitigation Measure 3.2-2 would reduce long-term operation-related (regional) emissions of criteria air pollutants and precursors (ROG, NO_X), but not to less-than-significant levels, because emissions and exposure levels could potentially exceed applicable thresholds and may conflict with air quality planning efforts. Therefore, residual significant impacts may occur. Long-term PM_{10} and $PM_{2.5}$ emissions would, however, be less than significant after mitigation.

All other air quality impacts, that is, construction-generated NO_X, traffic-generated CO hotspots, off-site mobile-source TACs, exposure to on-site generation of odorous emissions, and the need for a conformity analysis/conflict with Federal attainment planning would be less than significant, and therefore no residually significant impacts would occur.

3.2.5 CUMULATIVE IMPACTS

The project and the related projects are under the jurisdiction of the SMAQMD and are all located in the SVAB.

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the SVAB, and this regional impact is a cumulative impact; projects within the SVAB would contribute to this impact only on a cumulative basis. No single project would be sufficient in size, by itself, to result in nonattainment of the regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. All new development in Sacramento County that results in an increase in air pollutant emissions above those assumed in regional air quality plans contributes to cumulative air quality impacts (SMAQMD 2009:8-1–8-2).

The project comprises one of the larger projects in the SVAB, similar in size to the proposed Arboretum project south of the SPA, but smaller than Cordova Hills to the east. The project's contribution to air pollutant emissions

is expected to be similar to related projects in the region, and would have significant impacts on air quality in and of itself. An exceedance of the project-level thresholds does not necessarily constitute a significant cumulative impact (SMAQMD 2009:8-1). Because SunCreek is included in the Rancho Cordova General Plan and the MTP, the project is consistent with demographic projections (e.g., population, employment, VMT) assumed in the applicable air quality attainment plan, and a 15-point AQMP has been prepared in accordance with SMAQMD recommendations. The potential for significant cumulative effects resulting from development of the SPA, in addition to other projects in the nearby area and in the SVAB as a whole, is discussed below.

Criteria Air Pollutants: Temporary and Short-Term Construction Impacts

For all five action alternatives except the No USACE Permit Alternative, mitigated NO_X emissions from construction activities (after application of Mitigation Measure 3.2-1a) would still exceed SMAQMD's thresholds, in the absence of paying an off-site mitigation fee to offset NO_X emissions (Mitigation Measure 3.2-1b). Because the SPA is adjacent to several related projects that could be undergoing construction at the same time (Aboretum, Arista Del Sol, The Ranch at Sunridge, and Cordova Hills), it is possible that the impact of construction emissions of NO_X, resulting from development of the SPA and related projects, would be cumulatively considerable if emissions from all projects are not mitigated or offset within the region to less-than-significant levels. Considering the nonattainment status of Sacramento County and the SVAB for ozone, and considering the NO_X emissions of the related projects, construction of the SPA could result in a construction-related air quality impact that is considered a cumulatively considerable incremental contribution to a significant cumulative impact (increase in regional NO_X emissions and resulting ozone formation).

PM concentrations associated with construction of the project are considered significant and unavoidable even with implementation of Mitigation Measure 3.2-1a. The related projects adjacent to SunCreek, both built (Anatolia III) and proposed (Arboretum, Arista Del Sol, The Ranch at Sunridge, and Cordova Hills), may contain sensitive receptors that would be potentially exposed to construction emissions occurring in the SPA, depending on daytime wind speed and direction. Considering the PM emissions of the related projects, construction of the SPA could result in a construction-related air quality impact for PM_{10} and $PM_{2.5}$ that is considered a cumulatively considerable incremental contribution to a significant cumulative impact from exposure of sensitive receptors to PM_{10} and $PM_{2.5}$ construction-related emissions concentrations.

Criteria Air Pollutants: Long-Term Operational Impacts

The project would result in mass emissions of ROG and NO_X that exceed SMAQMD's significance threshold of 65 lb/day. Substantial operational emissions of PM would also occur as a result of project operation. Implementation of Mitigation Measure 3.2-2 (that is, implementation of the AQMP), would reduce impacts associated with emissions of CAP emissions, but not to less-than-significant levels. However, the SPA was included in the Rancho Cordova General Plan and the MTP, so the cumulative operational impacts were accounted for in attainment planning efforts.

PM emissions associated with the project would be substantially reduced by implementation of Mitigation Measure 3.2-2 (AQMP) and PM emissions are predominantly mobile source emissions that would be distributed across the transportation network and therefore would not contribute substantially to pollutant concentrations. However, ozone precursor emissions attributable to the project, plus emissions from other reasonably foreseeable future projects nearby, and in the SVAB as a whole, would continue to contribute to long-term increases in emissions that would exacerbate existing and projected violations and slow air quality attainment progress. Therefore, the project would result in a cumulatively considerable incremental contribution to a significant cumulative impact from exposure of sensitive receptors to long-term operational CAP emissions.

Toxic Air Contaminants

Activities related to temporary and short-term construction and long-term operation of the project could expose nearby existing off-site or proposed on-site sensitive receptors to TAC emissions. TAC emissions associated with

temporary and short-term construction activities and stationary sources are site-specific, would be addressed through mitigation, and the impact is considered less than significant. The specific types of on-site commercial land uses have not yet been identified and could potentially generate substantial volumes of truck activity (e.g., warehouses, distribution centers) in the proximity of nearby sensitive receptors, thereby exposing these nearby on-site receptors to mobile-source operational TACs. However, the project's impact would be less than significant after implementation of Mitigation Measures 3.2-1a, 3.4-1, and 3.2-4 discussed above.

With regards to mobile-source TACs generated by cumulative traffic, related projects in the area, such as Arboretum, Ranch at Sunridge, and Cordova Hills (which also includes a university campus) would also develop land uses that would substantially increase traffic on nearby roadways, particularly Grant Line Road, and would subsequently increase emissions of off-site mobile-source TACs. Grant Line Road is of particular concern because it would accommodate a disproportionately high volume of diesel-powered truck trips, most of which would be associated with operation of the Teichert Quarry and other sand and gravel quarries northeast of the SPA. The substantial volume of traffic generated by the related projects would result in a cumulatively significant mobile-source TAC impact.

The cumulative land use compatibility of the SunCreek project with TAC-generating quarry truck volumes on Grant Line Road was assessed according to guidance provided by ARB's publication, *Air Quality and Land Use Handbook: A Community Health Perspective (Handbook)* (ARB 2005a), and SMAQMD's *Protocol* (SMAQMD 2011). The Land Use Handbook recommends that sensitive land uses be buffered by at least 500 feet from a freeway or major roadway. This recommendation "was based on traffic related studies that showed a 70 percent drop in PM concentrations at a distance of 500 feet from the roadway." (SMAQMD 2011) SMAQMD's *Protocol* provides more detailed guidance for assessing risk levels at receptors located close to a freeway or high-volume roadway. The guidance provided in SMAQMD's *Protocol* accounts for the orientation of the roadway (i.e., north-south or east-west), the orientation of the receptors relative to the roadway, the predominant wind direction, and the traffic volume during the peak traffic hour. The peak-hour traffic volumes used in this air quality analysis are based on the average daily traffic volumes and quarry truck volumes used in the traffic analysis prepared for this project (Fehr & Peers 2011). The *Protocol* uses the same 70-percent risk reduction approach as in the Land Use Handbook. Within Sacramento County, 276 excess cancer cases in one million is based on a hypothetical sensitive receptor located 50 feet from the edge of the nearest travel lane for the highest peak traffic volume reported by Caltrans for Sacramento County, reduced by 70% (SMAQMD 2011). If the screening criteria determine that the level of cancer would be lower than 276 in a million, the *Protocol* does not recommend further site specific analysis. If the level of cancer risk at a receptor is estimated to be greater than 276 in a million, the *Protocol* recommends the completion of a site-specific health risk assessment.

Both ARB's *Handbook* and SMAQMD's *Protocol* are considered screening level guidance and do not contain recommended thresholds of significance. However, in the absence of a recommended threshold of significance from ARB or SMAQMD, the City and USACE have decided to use their respective screening levels as the threshold of significance for evaluating roadside TAC exposure in this analysis.

Three proposed aggregate quarry projects north of Cordova Hills are expected to generate TACs on Grant Line Road, and project-generated sensitive receptors residential land uses under the No USACE Permit, Biological Impact Minimization, Conceptual Strategy, and Increased Development Alternatives) would be located within 500 feet of the roadway as buildout occurs within the SPA. Under the Proposed Project Alternative, commercial land uses, rather than residences, would be developed adjacent to Grant Line Road. The northeast portion of the SPA would be the last area to be constructed according to the project phasing map (see Exhibit 2-22 in Chapter 2, "Alternatives), and buildout of the easternmost area bordering Grant Line Road would occur sometime between 2025 and 2032. The SMAQMD Roadway Protocol uses 100,000 vehicles per day as a screening number. EMFAC 2007 results for Sacramento County indicate that diesel trucks (medium and heavy) comprise about 2% of the vehicle fleet in 2030, which equates to about 2,000 trucks in 100,000 vehicles (ARB 2006). Average daily quarry truck volumes (Fehr & Peers 2011) were estimated and used to evaluate the potential impact of high-volume roadway TAC emissions on sensitive receptors (detailed calculations are included in Appendix L). The number of

quarry trucks modeled to determine exposures to sensitive receptors were 2,130, which just exceeds the basic SMAQMD Roadway Protocol screen, because the screen is based on approximately 2,000 trucks per day (out of 100,000 vehicles total).

Grant Line Road has a north-south orientation with respect to the SPA, and sensitive receptors would be located 20 to 130 feet to the west of the road (see Chapter 2, "Alternatives"). Approximately 213 trucks would be driving north-south on Grant Line Road during peak hour (daily truck volume by 10). Dividing 213 by 2% (the average medium and heavy diesel truck percentage in Sacramento County in 2030, see Section 3.15, "Traffic and Transportation" and Appendix L), results in about 10,650 peak hour vehicles. SMAQMD's screening tables, as well as overestimation of traffic/diesel truck numbers by rounding from 10,650 to 12,000 in peak hour (per protocol guidance), provide a conservative estimate of cancer risk.

NCP, BIM, ID

Under the No USACE Permit and Increased Development Alternatives, sensitive land uses would be located 20 feet from the west of the edge of Grant Line Road, which is anticipated to carry a disproportionately high percentage of heavy-duty vehicle trucks associated with the development of several new aggregate quarries. According to Table 2 of the Protocol (SMAQMD 2011:10), the incremental cancer risk associated with 12,000 vehicles/peak hour, with sensitive receptors located 20 feet from the west of the edge of the roadway (rounded down to 10 feet, per protocol guidance), results in an incremental cancer risk of about 429 in a million, which exceeds the evaluation criterion of 276 in a million. Under the Biological Impact Minimization Alternative, sensitive land uses would be located 40 feet west of the edge of Grant Line Road. According to Table 2 of the Protocol (SMAQMD 2011:10), the incremental cancer risk associated with 12,000 vehicles/peak hour, with sensitive receptors located 40 feet west of the edge of the roadway (rounded down to 25 feet, per protocol guidance), results in an incremental cancer risk of about 340 in a million, which exceeds the evaluation criterion of 276 in a million. (The evaluation criterion is a cancer risk value that is based on the reasonable worst-case siting situation within the boundaries of SMAQMD, and is used as the threshold of significance for the purposes of this DEIR/DEIS.) Therefore, on-site sensitive receptors would be exposed to substantial pollutant concentrations as a result of traffic generated by the related projects.

Mitigation Measure CUM AIR-1: Implement Measures to Reduce Exposure of Sensitive Receptors to Long-Term Operational Emissions of Toxic Air Contaminants.

For every proposed sensitive land use (i.e. residences, schools, playgrounds, day care centers, nursing homes, and medical facilities) in the SunCreek SPA within 50 feet of Grant Line Road, a HRA shall be performed by each individual project applicant to determine whether existing or proposed on-site sensitive receptors will be exposed to TAC emissions that exceed an incremental increase of 10 in 1 million for cancer risk and/or a noncarcinogenic HI of 1.0. If the results of the HRA indicate that the cancer risk or HI exceeds the above-mentioned limits, the individual project applicant shall employ measures to reduce exposures to levels below the limits, which may include one or more of the following:

- Where necessary to reduce exposure of sensitive receptors to a level that is below an incremental increase of 10 in 1 million for the cancer risk and/or a noncarcinogenic HI of 1.0, proposed sensitive land uses would:

    1. Plant a tree barrier along the entire SPA property line abutting Grant Line Road using an appropriate species of hardy, drought resistant, fast-growing, fine-needled evergreen trees (i.e., pine, cedar, or redwood, SMAQMD 2011, Fuller, et al., 2009). Density of planting should result in a semi-solid barrier to block out roadway pollution, while maintaining tree health.

2. Locate building air intakes on the sides of the SPA buildings that are more distant from the odor source and require levels of air filtration that exceed Title 24 standards or the local building codes.

3. Manage SPA buildings as systems with continuous positive pressure to prevent infiltration of unfiltered outside air.

4. Execute and record deed notices on SPA properties and provide copies to initial and subsequent prospective buyers, lessees, and renters of all properties within the SPA, particularly residential buyers, with information that their respective properties would potentially be subject to objectionable diesel exhaust from a known nearby DPM source.

The No USACE Permit, Biological Impact Minimization, and Increased Development Alternatives would generate substantial amounts of additional traffic on local roadways, as discussed in Section 3.15, "Traffic and Transportation" (and in Impact 3.2-2 above). While the Biological Impact Minimization alternative does not include commercial uses, the No USACE Permit and Increased Development Alternatives would also include 6.7 and 17.7 acres, respectively, of commercial land uses that would attract delivery truck traffic, which could contribute to DPM concentrations in the vicinity of the SPA. The specific types of commercial uses that would be developed within the SPA are not currently known, but grocery stores could attract approximately 20 delivery truck trips per day (one trip to the subject establishment and one trip away), whereas retail establishments may only have a few delivery truck trips per week (McCormack et al. 2010 and Pearson et al. 2009). The increased amount of passenger car, light-duty, and heavy-duty vehicle traffic generated by the project, when considered in combination with the vehicle traffic generated by the related projects (including heavy-duty quarry trucks), would result in a cumulatively considerable incremental contribution to a cumulatively significant off-site mobile-source operational TAC impact.

> **Mitigation Measure:** No feasible mitigation is available to reduce the cumulative mobile-source operational TAC impacts to off-site sensitive receptors. The City cannot adopt vehicle emissions controls or regulations on fuel content that would reduce the rate of TAC emissions from trucks and it is not feasible for the City to re-route potential delivery trucks associated with on-site uses such that the routes would avoid areas with sensitive receptors and quarry truck traffic.

PP, CS

Under the Proposed Project Alternative, commercial land uses would be located adjacent to Grant Line Road. The wind direction is predominantly from the south and the section of Grant Line Road of concern lies at the eastern edge of the SPA. Under the Conceptual Strategy Alternative, sensitive land uses would be located 130 feet from the west edge of Grant Line Road. According to Table 2 of the Protocol (SMAQMD 2011:10), the incremental cancer risk associated with 12,000 vehicles/peak hour, with sensitive receptors located 130 feet from the west edge of the roadway (rounded down to 100 feet, per protocol guidance), results in an incremental cancer risk of about 169 in a million, which does not exceed the evaluation criterion of 276 in a million. Therefore, on-site sensitive receptors under the Proposed Project and Conceptual Strategy Alternatives would not be exposed to substantial pollutant concentrations as a result of traffic generated by the related projects.

The Proposed Project and Conceptual Strategy Alternatives would generate substantial amounts of additional traffic on local roadways, as discussed in Section 3.15, "Traffic and Transportation" (and in Impact 3.2-2 above). The Proposed Project Alternative also anticipates the development of a 60-acre Local Town Center, along with 31.9 acres of Commercial Mixed Use, for a total of 91.9 acres of commercial land uses that could include hotels, restaurants, and grocery stores, along with a variety of retail shopping opportunities including large warehouse-style businesses. These commercial land uses would attract a substantial amount of delivery truck traffic, which could contribute to DPM concentrations in the vicinity of the SPA. (See also Impact 3.2-4, above.) The specific types of commercial uses that would be developed within the SPA are not currently known, but grocery stores

could attract approximately 20 delivery truck trips per day (one trip to the subject establishment and one trip away), whereas retail establishments may only have a few delivery truck trips per week (McCormack et al. 2010 and Pearson et al. 2009). Therefore, the increased amount of passenger car, light-duty, and heavy-duty vehicle traffic generated by the project, when considered in combination with the vehicle traffic generated by the related projects (including heavy-duty quarry trucks), would result in a cumulatively considerable incremental contribution to a cumulatively significant off-site mobile-source operational TAC impact.

> **Mitigation Measure:** No feasible mitigation is available to reduce the cumulative mobile-source operational TAC impacts to off-site sensitive receptors. The City cannot adopt vehicle emissions controls or regulations on fuel content that would reduce the rate of TAC emissions from trucks and it is not feasible for the City to re-route potential delivery trucks associated with on-site uses such that the routes would avoid areas with sensitive receptors and quarry truck traffic.

Emissions attributable to the project, plus emissions from other reasonably foreseeable future projects nearby, and in the SVAB as a whole, would continue to contribute to long-term increases in emissions that could expose sensitive receptors to TAC emissions under all five action alternatives. Under the No USACE Permit, Biological Impact Minimization, and Increased Development Alternatives, implementation of Mitigation Measure CUM AIR-1, would require performance of an HRA to determine the incremental cancer risk of on-site sensitive land uses, and measures would be implemented to reduce on-site TAC exposure levels below the threshold. Therefore, the project would not result in a cumulatively considerable incremental contribution to a significant on-site cumulative impact from mobile-source TAC emissions. However, as discussed above, no feasible mitigation measures are available to reduce the project's contribution to off-site cumulatively significant mobile-source TAC emissions. Therefore, this cumulative impact would be significant and unavoidable for all five action alternatives.

Carbon Monoxide

The traffic modeling for cumulative (2032) conditions, which includes project-generated traffic and traffic generated by the related projects (Fehr & Peers 2010), indicates that less-than-significant air quality impacts from mobile sources of CO would occur (see Impact 3.2-3 and Appendix L for further details). CO emission factors in future years are expected to be lower than current levels due to more stringent vehicle emissions standards and improvements in vehicle emissions technology. Thus, ambient local CO concentrations under cumulative conditions would continue to decline. Therefore, 1- and 8-hour CO concentrations for the future cumulative conditions would not be anticipated to exceed the significance thresholds of 20 ppm and 9 ppm, respectively. Consequently, the project would not result in a cumulatively considerable incremental contribution to a significant cumulative impact from exposure of sensitive receptors to CO emissions from mobile sources.

Odor Impacts

The following analysis is provided for NEPA purposes only. CEQA does not require an analysis of the impact of the existing environment on the project.

Construction activities associated with both the SPA and the related projects could expose sensitive receptors to odorous emissions. Also, operation-related activities at proposed commercial areas, both within the SPA and within the related projects, could result in emissions of odors from such land uses as fast food restaurants, bakeries, and nail salons in close proximity to proposed sensitive receptors.

Odor emissions associated with construction and operation of the project would be reduced to a less-than-significant level after implementation of Mitigation Measures 3.2-4 and 3.2-5 identified above. Both the project and the related projects (e.g., Arboretum) would result in exposure of additional new sensitive receptors to odor sources in the area (i.e., Sacramento Rendering Company, the Kiefer Landfill, and Lopez Ag Service), as well as exposure of sensitive receptors to future mobile- and stationary-source odors generated within the SPA and adjacent developments. Another proposed project, the Kiefer Landfill Special Planning Area, would include expansion of the current Kiefer landfill (described in the "Affected Environment" section above) to within

approximately 1 mile of the SunCreek SPA. The proposed expansion of the Kiefer Landfill (not including the buffer area) includes 651 acres of new landfill area, and would be located approximately 0.5-0.8 miles south of the easternmost portion of the SunCreek SPA. An additional 569 acres slated for industrial waste processing activities would be located adjacent to the new landfill area and again, within about 0.5-0.8 miles south of the easternmost portion of the SPA. Although the new landfill and waste processing activities/facilities would presumably be permitted facilities, the potential exists for odor emissions to occur within 1 mile of the SPA, which would fall within the current SMAQMD-recommended screening distance of 1 mile and therefore could generate objectionable odors at the SPA.

Existing odor sources in the vicinity of the SPA, along with expansion of the Kiefer Landfill, could result in potentially significant cumulative impacts related to odorous emissions. However, the project's odor emissions are not expected to generate any odor-related complaints to SMAQMD, and the project does not include similar odors that would combine with odors from activities in the vicinity of the SPA to substantially increase the severity or extent of odor-related impacts. In addition, project-related odor effects would be reduced through the implementation of mitigation measures described above. Therefore, the project's short-term construction odor emissions and long-term operational odor emissions would not result in a cumulatively considerable incremental contribution to a significant cumulative impact.

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