
3.3 - Air Quality

3.3.1 - Introduction

This section describes the existing air quality setting and potential direct and indirect air quality effects from project implementation on the site and its surrounding area. Michael Brandman Associates performed air quality analysis for the proposed project, which included emissions modeling using EMFAC2007 and qualitative assessments of air pollutant emissions for the potential indirect future development that could result from implementation of the SOIA. Emissions modeling output is provided in Appendix B.

3.3.2 - Environmental Setting

This section discusses meteorological conditions, including temperature, precipitation, and wind. Meteorology is the study of weather and climate. Weather refers to the state of the atmosphere at a given time and place with regard to temperature, air pressure, humidity, cloudiness, and precipitation. The term weather refers to conditions over short periods; conditions over long periods, generally at least 30 to 50 years, are referred to as climate. Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

Sacramento Valley Air Basin

The project is located within the Sacramento Valley Air Basin (SVAB), a large north-south-oriented valley in Northern California. The SVAB is generally shaped like a bowl. It is open in the south and surrounded by mountain ranges on all other sides. The Sierra Nevada Mountains form the eastern border of SVAB, and the Coastal Ranges are located along the western boundary of the SVAB.

The SVAB encompasses 11 counties, including Shasta, Tehama, Glenn, Colusa, Yolo, Butte, Yuba, Sutter, and Sacramento. The SVAB also includes the northeastern half of Solano County and the western portion of Placer County. The SVAB is further divided into two planning areas: the Broader Sacramento Area that consists of the southern (more populated) portion of the SVAB, and the Upper Sacramento Valley. The project is located in the Broader Sacramento Area portion of the SVAB.

Transport

Transport is the term used to describe the flow of air pollutants from one geographic area to another. The project area is considered both a contributor and recipient of transported air pollutants. The air quality in the Broader Sacramento Area can be impacted by ozone precursors generated in the San Francisco Bay Area, and on occasion, by pollutants transported from the San Joaquin Valley. However, local emissions dominate the inventory of air pollution on hot, stagnant summer days. (ARB 2001).

Climate and Meteorology

The climate in the Sacramento Valley area is classified as Mediterranean, with mild, wet winters and warm, dry summers. The major climatic controls are the Pacific High Pressure System over the eastern Pacific Ocean and the local topography. The formation of a high-pressure area over the Great Basin Region to the east of the Sierra Nevada also affects the meteorology of the Sacramento area, primarily during the winter months.

The Pacific High Pressure System is a semi-permanent, subtropical, high-pressure system located on the Pacific Coast. The size and strength of the Pacific High Pressure System varies seasonally. By varying degrees, weather in the summer, spring, and fall is generally a result of the movement and intensity of the Pacific High Pressure System. During the summer, its size and strength is at a maximum and the regional climate is dominated by its influence. As a result, clear skies with intense solar heating occur over California's interior, forming a thermal trough of low pressure. This low-pressure trough intensifies the prevailing northwesterly flow over the area. Little precipitation occurs during the summer because the Pacific High Pressure System blocks migrating extra-tropical weather systems.

As the Pacific High Pressure System shifts southward during the fall, its dominance over the area diminishes. During the winter, three weather regimes generally prevail:

1. Storm periods characterized by cloudiness, precipitation, and shifting, gusty winds.
2. Clear weather associated with either a buildup of pressure over the interior of California or the influence of a well-developed Great Basin High Pressure system.
3. Persistent fog or stratus clouds and temperature inversions associated with a weak influence of the Great Basin High, trapping a layer of cool, moist air in the interior valleys.

Thus, sky cover, temperature, and humidity conditions are much more variable during the winter. Air movement is also variable, with stagnant conditions occurring more frequently than during the summer months.

The prevailing wind in this area is southerly all year. This is due to the north-south orientation of the valley and the deflecting effects of the towering Sierra Nevada on the prevailing oceanic wind that moves through the Carquinez Strait near the Delta, at the junction of the Sacramento and San Joaquin rivers. This phenomenon causes what is locally termed the "delta breeze." No other tidewater gap exists in the Coastal Mountains to admit significant marine air into the Sacramento or the San Joaquin valleys.

Occasionally, a strong north or northeasterly barometric pressure gradient develops, forcing air south or southwestward down the Siskiyou Mountains or the Sierra Nevada. This air is warmed by compression as it descends, reaching the valley floor as a hot, dry north wind. Heat waves in the

summer are produced by these winds and fortunately, are usually followed within 2 or 3 days by the normally cool, southwest delta breezes, especially at night.

The vertical mixing of air pollutants is limited by the presence of persistent temperature inversions. A temperature inversion is a meteorological phenomenon where air temperature increases with height. Usually, within the lower atmosphere (the troposphere), the air near the surface of the earth is warmer than the air above it, largely because the atmosphere is heated from below by solar radiation absorbed at the surface. Sometimes the gradient is inverted, so that the air gets colder nearer to the surface of the Earth: this is a temperature inversion.

Inversions may be either ground level or elevated. Ground-level inversions occur frequently during early fall and winter (i.e., October through January). High concentrations of primary pollutants, which are those emitted directly into the atmosphere (e.g., carbon monoxide), may be found at these times. Elevated inversions act as a lid over the SVAB and limit vertical mixing. Severe air stagnation occurs as a result of these inversions. Elevated inversions contribute to the occurrence of high levels of ozone during the summer months.

Summers are usually dry with warm to hot afternoons and mostly mild nights. The rainy season generally is from November through March. About 75 percent of the annual precipitation occurs then, but measurable rain falls only on an average of 9 days per month during that period. The shielding effect of mountains to the north, east, and west usually modifies winter storms.

Topographic effects, the north-south alignment of the valley, the coast range, and the Sierra Nevada strongly influence the wind flow in the project area. A sea-level gap in the Coast Range allows cool, oceanic air to flow occasionally into the valley during the summer season, with a marked lowering of temperature through the Sacramento-San Joaquin River Delta to the capital. In the spring and fall, a large north-to-south pressure gradient develops over the northern part of the State. Air flowing over the Siskiyou Mountains to the north warms and dries as it descends to the valley floor. Winter storms can bring strong, southerly winds.

Elk Grove's proximity to the Pacific Ocean and location within the Sacramento Valley are the greatest influences on temperature variability in the project area. The nearest weather station to the Amendment area is the Sacramento Executive Airport, approximately 13 miles northwest. For the period of record (1947 to 2007) average daytime maximum temperatures in the summer (June, July, August) was 91 degrees Fahrenheit (°F), whereas the average wintertime (December, January, February) daytime maximum was only 56°F. Nighttime minimum temperatures in the summer are 57°F and the nighttime minimum temperatures in the winter are 39°F. The summer months have an average of 52 days in which the maximum temperature is equal to or greater than 90°F. The winter months have an average of 16 days in which the minimum temperature is equal to or less than 32°F. Hot spells can occur from May to October, where temperatures may exceed 100°F, and are typically

caused by airflow from sub-tropical, high-pressure areas that bring light to nearly calm winds and humidity below 20 percent (WRCC 2010).

Annual average rainfall is approximately 17 inches, with almost 89 percent of rain falling between the months of November and April. Rainfall during these months is primarily due to winter storms. Thunderstorms are few in number, usually mild in character, and occur mainly in the spring. An occasional thunderstorm may drift over the valley from the Sierra Nevada in the summer. Snow falls so rarely, and in such small amounts, that its occurrence may be disregarded as a climatic feature. Heavy fog occurs quite frequently in mid-winter, rarely in the summer months, and seldom in spring or fall. The fog may last several days if stagnant atmospheric conditions are present (WRCC 2007).

Winds in the impacted area are seasonally influenced. The prevailing wind is from the south primarily because of marine breezes through the Carquinez Strait, although during winter, the sea breezes diminish and winds from the north occur more frequently. Winter storms, however, can bring strong southerly winds. Between late spring and early fall, a layer of warm air often overlays a layer of cool air from the Delta and San Francisco Bay, resulting in an inversion. Typical winter inversions are formed when the sun heats the upper layers of air, trapping below them air that has been cooled by contact with the colder surface of the Earth during the night. Although each inversion type predominates at certain times of the year, both types can occur at any time of the year. Local topography produces many variations that can affect the inversion base and thus influence local air quality.

Regional Air Quality

Background

An emissions inventory is an account of the amount of air pollution generated by various emissions sources. To estimate the sources and quantities of air pollution, the California Air Resources Board (ARB), in cooperation with local air districts and industry, maintains an inventory of California emission sources. Sources are subdivided into the four major emission categories: mobile, stationary, areawide, and natural sources.

Mobile Sources include on-road sources and off-road mobile sources. The on-road emissions inventory, which includes automobiles, motorcycles, and trucks, is an estimation of population, activity, and emissions of the on-road motor vehicles used in California. The off-road emissions inventory is an estimate of the population, activity, and emissions of various off-road equipment, including recreational vehicles, farm and construction equipment, lawn and garden equipment, forklifts, locomotives, commercial marine ships, and marine pleasure craft. ARB staff estimates mobile source emissions with assistance from districts and other government agencies.

Stationary sources are large, fixed sources of air pollution, such as power plants, refineries, and manufacturing facilities. Stationary sources also include aggregated point sources. These include

many small point sources, or facilities, that are not inventoried individually but are estimated as a group and reported as a single-source category. Examples include gas stations and dry cleaners. Each of the local air districts estimates the emissions for the majority of stationary sources within its jurisdiction. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location.

Areawide sources include source categories associated with human activity, and these emissions take place over a wide geographic area. Consumer products, fireplaces, farming operations (such as tilling), and unpaved road dust are examples of areawide sources. ARB and local air district staffs estimate areawide emissions. Emissions from areawide sources may be either from small, individual sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products and dust from unpaved roads.

Natural, or non-anthropogenic, sources include source categories with naturally occurring emissions such as geogenic (e.g., petroleum seeps), wildfires, and biogenic emissions from plants. ARB staff and the air districts also estimate natural sources.

Sacramento County Emissions Inventory

The 2008 emissions inventory for Sacramento County is available in ARB’s 2009 Almanac Emission Projection Data. Table 3.3-1 summarizes the estimated 2008 emissions for the main pollutants of concern in Sacramento County.

Table 3.3-1: 2008 Sacramento County Emissions Inventory

Emission Category	Tons per Day			
	ROG	NO _x	PM ₁₀	PM _{2.5}
Stationary Sources	8.07	3.90	1.50	0.90
Areawide Sources	17.27	3.10	39.38	10.12
Mobile Sources	35.63	68.98	3.55	2.79
Natural Sources	10.18	0.01	0.02	0.02
Total Sacramento County	71.15	75.99	44.45	13.83
Source: ARB 2009.				

ROG. Mobile sources contributed approximately 50 percent of the 2008 reactive organic gases (ROG) emissions, with on-road motor vehicle emissions constituting the majority of the mobile emissions. Areawide sources accounted for approximately 24 percent of the 2008 emissions inventory.

NO_x. Mobile sources generated the majority of oxides of nitrogen (NO_x) emissions in Sacramento County at approximately 91 percent of the total NO_x inventory.

Air Quality

PM₁₀. For particulate matter smaller than 10 microns in diameter (PM₁₀), areawide sources contributed more almost 90 percent of the 2008 inventory. The main PM₁₀-generating areawide sources include unpaved road dust, paved road dust, and construction and demolition.

PM_{2.5}. Areawide sources contributed more than 70 percent of the 2008 inventory of particulate matter smaller than 2.5 microns in diameter (PM_{2.5}), and mobile sources generated approximately 20 percent of the inventory. The main PM_{2.5}-generating areawide sources include residential fuel combustion and paved road dust.

Local Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. The Sacramento Metropolitan Air Quality Management District (SMAQMD) and the ARB operate monitoring stations throughout Sacramento County. Existing levels of ambient air quality and historical trends and projections of air quality in the project area are best documented from measurements made near the SOIA Area. The SMAQMD operates one air monitoring station in the Elk Grove amendment area. The Elk Grove/Bruceville Road Site is at 12490 Bruceville Road in Elk Grove, CA. At the Elk Grove/Bruceville Road Site, the air monitoring station monitors ozone and PM_{2.5}, as well as NO₂. Table 3.3-2 summarizes 2004 to 2006 published monitoring data.

Table 3.3-2: Local Air Quality Monitoring (Elk Grove/Bruceville Road Station)

Air Pollutant, Averaging Time (Units)	2007	2008	2009
Ozone			
Max 1 Hour (ppm)	0.102	0.111	0.102
Days > CAAQS (0.09 ppm)	1	5	2
Max State 8 Hour (ppm)	0.088	0.093	0.087
Days > CAAQS (0.07 ppm)	13	13	12
Days > NAAQS (0.08 ppm)	5	7	5
Fine particulate matter (PM_{2.5})			
State Annual Average (µg/m ³)	*	16.1	14.6
National Annual Average (µg/m ³)	*	*	*
Max State 24 Hour (µg/m ³)	57.7	83.3	41.0
Max National 24 Hour (µg/m ³)	*	*	*
Estimated Days > NAAQS (65 µg/m ³)	*	*	*
Abbreviations: > = exceed ppm = parts per million µg/m ³ = micrograms per cubic meter CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard Mean = Annual Arithmetic Mean NA = Not applicable (standard not in effect) ¹ From the California measurement. * No data was available for these dates. Source: ARB 2010a.			

Odors

The SMAQMD provides the following examples of sources of odor in its 2009 Guide to Air Quality Assessment: agriculture, wastewater treatment, food processing, chemical plants, composting, landfills, dairies, and rendering plants. The proposed amendment area primarily contains agricultural uses consisting of fallow/row crops/nursery, orchards, vineyard, and livestock operations. The proposed incorporation area does not contain substantial amounts of food processing, chemical plants, or composting facilities. In the context of land use planning, it is important to consider the distance between the odor source and receptors (also known as a buffer zone or setback). The greater the distance between an odor source and receptor, the less concentrated the odor emission would be when it reaches the receptor. Because the area in question is quite rural, distance alone from odiferous sources can allow odors to disperse to lower, undetectable concentrations before reaching receptors.

Sensitive Receptors

Certain populations, such as children, the elderly, and persons with preexisting respiratory or cardiovascular illness, are particularly sensitive to the health impacts of air pollution. Some individuals are more severely impacted by air pollution than others, usually because of pre-existing health problems, proximity to the emissions source, or duration of exposure to air pollutants.

Residential areas are considered sensitive to poor air quality because people are often at home for extended periods and their exposure can be high. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise places a high demand on cardio-vascular function. People in industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, with most workers spending the majority of their time indoors.

The project contains existing rural residences throughout the proposed amendment area. More information about existing land uses within the proposed amendment area is provided in Section 3-8, Land Use.

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions).

Ozone

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROG and NO_x, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem, and often the effects of the emitted ROG and NO_x are felt a distance downwind of the emission sources. Ozone is

subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses such as pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In the United States alone, ozone is responsible for an estimated \$500 million in reduced crop production each year. Ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas. In addition, ozone causes damage to buildings, rubber, and some plastics.

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity,

and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

Respirable Particulate Matter (PM₁₀ and PM_{2.5})

Particulate matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small; they can only be detected using an electron microscope.

Particle pollution includes inhalable coarse particles, with diameters smaller than 10 micrometers and fine particles, with diameters that are 2.5 micrometers and smaller. For reference, PM_{2.5} is approximately one-thirtieth the size of the average human hair.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form in complicated reactions in the atmosphere between such chemicals as sulfur dioxides (SO_x) and NO_x, which are emitted from power plants, industries, and automobiles. These particles, known as secondary particles, make up most of the fine particulate pollution in the country.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposure has been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to

suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Other Criteria Air Pollutants

The standards for NO₂, SO₂, and lead are being met within the region, and trends in historical data of ambient concentrations of these pollutants show no signs of violating state or federal standards in the future.

Toxic Air Contaminants

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important, in terms of health risk, are diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

Toxic air contaminants are less pervasive in the urban atmosphere than criteria air pollutants, but they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of toxic air contaminants with varying degrees of toxicity. Sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

3.3.3 - Regulatory Framework

Air pollutants are regulated at the national, state, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates at the national level. The California Air Resources Board (ARB) regulates at the state level. The Sacramento Metropolitan Air Quality Management District (SMAQMD) regulates at the air basin level, maintaining ambient air monitoring sites, and regulating stationary sources and indirect sources.

Federal and State Regulatory Agencies

The EPA is responsible for global, international, national, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans, provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards, also known as federal standards. There are federal standards for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act of 1970. The criteria pollutants are:

- Ozone
- Nitrogen dioxide
- Lead
- Particulate matter (PM₁₀ and PM_{2.5})
- Carbon monoxide (CO)
- Sulfur dioxide

The federal standards were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health (California Air Resources Board 2010a).

A State Implementation Plan is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The State Implementation Plan for the State of California is administered by the ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. California’s State Implementation Plan incorporates individual federal attainment plans for regional air districts—air district prepares their federal attainment plan, which sent to ARB to be approved and incorporated into the California State Implementation Plan. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

The ARB also administers California Ambient Air Quality Standards (state standards) for the 10 air pollutants designated in the California Clean Air Act. The 10 state air pollutants are the six federal standards listed above as well visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The federal and state ambient air quality standards, relevant effects, properties, and sources of the pollutants are summarized in Table 3.3-3.

Table 3.3-3: Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard
Ozone (O ₃)	1 hour	0.09 ppm	—
	8 hour	0.070 ppm	0.075 ppm
Particulate matter (PM ₁₀)	24 hour	50 µg/m ³	150 µg/m ³
	Mean	20 µg/m ³	—
Particulate matter (PM _{2.5})	24 hour	—	35 µg/m ³
	Mean	12 µg/m ³	15.0 µg/m ³
Carbon monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hour	9.0 ppm	9 ppm

Table 3.3-3 (cont.): Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard
Nitrogen dioxide (NO ₂)	1 hour	0.18 ppm	0.100 ppm
	Mean	0.030 ppm	0.053 ppm
Sulfur dioxide (SO ₂)	1 hour	0.25 ppm	0.075 ppm
	3 hour	—	0.5 ppm
	24 hour	0.04 ppm	—
Lead	30-day	1.5 µg/m ³	—
	Quarter	—	1.5 µg/m ³
	Rolling 3-month average	—	0.15 µg/m ³
Sulfates	24 hour	25 µg/m ³	—
Hydrogen sulfide	1 hour	0.03 ppm	—
Vinyl chloride	24 hour	0.01 ppm	—
Visibility-reducing particles	8 hour	Extinction coefficient of 0.23 per kilometer, visibility of 10 miles or more due to particles when relative humidity is less than 70 percent	—
Abbreviations: ppm = parts per million Mean = Annual Arithmetic Mean Source: ARB 2010b.			
µg/m ³ = micrograms per cubic meter 30-day = 30-day average Quarter = Calendar quarter			

ARB's Land Use Handbook

The ARB adopted the Air Quality and Land Use Handbook: A Community Health Perspective (Land Use Handbook) in 2005. The Land Use Handbook provides information and guidance on siting sensitive receptors in relation to sources of TACs. The sources of TACs identified in the Land Use Handbook are high traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gas dispensing facilities. If the project involves siting a sensitive receptor or source of TAC discussed in the Land Use Handbook, siting mitigation may be added to avoid potential land use conflicts, thereby reducing the potential for health impacts to the sensitive receptors.

Local Regulatory Agencies

The specific air pollution control agency for the County of Sacramento is the SMAQMD, but various local, regional, state, and federal government agencies share the responsibility for air quality management in Sacramento County. The SMAQMD operates at the local level, with primary

responsibility for attaining and maintaining the national and state ambient air quality standards in Sacramento County. Other local agencies are responsible for the other counties in the larger nonattainment area. The air districts work jointly with the EPA, the ARB, Sacramento Area Council of Governments (SACOG), county transportation and planning departments, cities, and counties, and various non-governmental organizations to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs.

Sacramento County, as well as some of the counties surrounding it, has been designated “severe” nonattainment for ozone by the EPA. This area is labeled the Sacramento Federal Ozone Nonattainment Area (SFNA). The SMAQMD is not only responsible for achieving federal and state air quality standards to ensure healthy air in Sacramento County; it is also responsible for working with jurisdictions outside of Sacramento County to bring the entire SFNA into compliance.

In addition to state and federal powers to regulate criteria air pollutants, Sacramento County has acknowledged its responsibilities regarding air quality issues by preparing an Air Quality Element for the General Plan. Although the County has no direct regulatory authority over emission sources, it recognizes that land use decisions effect how and where motor vehicles are driven. Because motor vehicles are the largest pollution source in the area, the General Plan lists policy goals and plans that will improve land use and transportation decisions. Table 3.3-4 shows the current status of Sacramento County with the ambient air quality standards.

Table 3.3-4: Sacramento County Air Quality Attainment Status

Parameter	California Standard	Federal Standard
Ozone	Nonattainment Classification=Serious	Nonattainment1 Classification=Severe
Respirable particulate matter (PM ₁₀)	Nonattainment	Nonattainment2 Classification=Moderate
Fine particulate matter (PM _{2.5})	Nonattainment	Nonattainment3
Carbon monoxide	Attainment for 1-hour and 8-hour standards	Attainment for 1-hour and 8-hour standards
Nitrogen dioxide	Attainment for 1-hour standard	Attainment for annual standard
Sulfur dioxide	Attainment for 1-hour and 8-hour standards	Attainment for 3-hour, 24-hour, and annual standards
Lead	Attainment for 30-day standard	Attainment for calendar quarter standard
Visibility-reducing particles	Unclassified for 8-hour standard	No federal standard
Sulfates	Attainment for 24-hour standard	No federal standard
Hydrogen sulfide	Unclassified for 1-hour standard	No federal standard

Table 3.3-4 (cont.): Sacramento County Air Quality Attainment Status

Parameter	California Standard	Federal Standard
<p>Notes:</p> <ol style="list-style-type: none"> 1 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, was submitted from the Air Resources Board to EPA on February 14, 2008. EPA approved the request effective June 4, 2010. 2 Air quality meets the federal PM₁₀ standards. However, the SMAQMD must request redesignation and submit a maintenance plan to be formally designated as attainment. 3 EPA promulgated a new 24-hour standard for PM_{2.5}. The EPA Administrator signed the final PM_{2.5} nonattainment designations for Sacramento on October 8, 2009. The designations become effective 30 days after publication in the Federal Register. <p>Source: SMAQMD 2011.</p>		

Voluntary Federal Reclassification Request

On February 14, 2008, the five air districts that constitute the Sacramento Region requested ARB to submit a formal request to EPA to reclassify the area from “serious” to “severe” nonattainment for the federal 8-hour ozone standard, with an associated attainment deadline of June 15, 2019. The request is based on an evaluation of the emission reductions necessary to attain the federal standard, and the emission reductions associated with feasible rules. It was determined that the Sacramento Region would not be able to achieve the necessary emission reduction in the existing attainment timeframe through the existing suite of feasible rules.

Air Quality Plans

Federal Plans

The 1994 Sacramento Regional Clean Air Plan (also called the State Implementation Plan or SIP) was developed cooperatively with all the districts in the Sacramento Region: El Dorado Air Pollution Control District (APCD), Feather River Air Quality Management District (AQMD), Placer County APCD, SMAQMD, and Yolo-Solano AQMD. The Clean Air Plan was adopted in 1994 in compliance with the 1990 Amendments to the Federal Clean Air Act. At that time, the Sacramento region could not show that it would meet the federal 1-hour ozone standard by 1999. In exchange for moving the deadline to 2005, the region accepted a designation of “severe nonattainment” for the federal 1-hour ozone standard, with additional emission requirements on stationary sources.

As a “severe nonattainment” area, the Sacramento Region is required to submit a rate-of-progress milestone evaluations pursuant to Section 182(g) of the Federal Clean Air Act. The Sacramento Regional 1999 Milestone Report was also developed cooperatively with the above-named districts and included a compliance demonstration that the milestone requirements were met. The 2002 Milestone Report also includes a compliance demonstration that the 2002 milestone requirement has been met for the Sacramento nonattainment area.

The Sacramento region has been designated as a “serious” nonattainment area for the federal 8-hour ozone standard with an attainment deadline of June 2013. The Sacramento region air districts

adopted the 8-Hour Ozone Attainment and Reasonable Further Progress Plan in early 2009. This plan includes the information and analyses to fulfill the federal CAA requirements for demonstrating reasonable further progress and attainment of the 1997 8-hour ozone standard for the Sacramento region. In addition, the plan establishes an updated emissions inventory, provides photochemical modeling results, proposes the implementation of reasonably available control measures, and sets new motor vehicle emission budgets for transportation conformity purposes.

In 2002, the U.S. EPA officially determined that Sacramento County had attained the PM₁₀ National Ambient Air Quality Standards by the attainment deadline. The County prepared the PM₁₀ Implementation/Maintenance Plan and Redesignation Request for Sacramento County, last updated October 28, 2010. As of this date, the EPA has not formally approved the plan or redesignation request. The purpose of the plan is to fulfill the requirements for EPA to re-designate Sacramento County to attainment by preparing the following plan elements and tasks:

- Document the extent of the PM₁₀ problem in Sacramento County
- Determine the emission inventory sources contributing to the PM₁₀ problem
- Identify the appropriate control measures that achieved attainment of the PM₁₀ NAAQS
- Demonstrate maintenance of the PM₁₀ NAAQS
- Request formal re-designation of the PM₁₀ NAAQS
- Establish PM₁₀ Motor Vehicle Emission Budgets for Sacramento County

On October 16, 2006, the EPA promulgated a new 24-hour standard for PM_{2.5}. This change lowered the daily standard from 65µg/m³ to 35µg/m³ to protect the general public from short-term exposure of the fine particulate matter. As shown in Table 3.3-4, Sacramento County does not meet the new standards. An attainment plan must be submitted not later than 3 years after the effective date of the designation (EPA estimates this to be April 2012). The plan must include transportation conformity budgets and control measures.

State Plans

The CCAA requires nonattainment areas to achieve and maintain the state ambient air quality standards by the earliest practicable date and local air districts to develop plans for attaining the state standards. In compliance with the CCAA, the SMAQMD prepared and submitted the 1991 Air Quality Attainment Plan mainly to address Sacramento County's nonattainment status for ozone and CO. The CCAA also requires that by the end of 1994 and once every 3 years thereafter, the districts are to assess their progress toward attaining the air quality standards. The triennial assessment is to report the extent of air quality improvement and the amounts of emission reductions achieved from control measures for the preceding three-year period. The latest Triennial Report (2009 Triennial Report) was submitted for approval by the SMAQMD Board of Directors on March 26, 2009. In addition, the SMAQMD is required to submit an annual progress report to the ARB by December 31 of each year.

Local

City of Elk Grove

Approval by LAFCo of this SOIA does not authorize any change in land use or governance. However, the proposed project would adjust the City of Elk Grove's SOI and allow the City the opportunity to file an annexation request with LAFCo to annex lands within the SOIA Area. The City of Elk Grove General Plan establishes goals and policies to guide both present and future development within the City's jurisdiction. The City of Elk Grove's General Plan policies related to directly or indirectly to air quality that may apply to potential future development in the SOIA Area are provided below:

- **Policy CAQ-26:** It is the policy of the City of Elk Grove to minimize air pollutant emissions from all City facilities and operations to the extent feasible and consistent with the City's need to provide a high level of public service.
- **CAQ-26-Action 1:** The City shall encourage all its employees to use transportation alternatives such as public transit, bicycling, walking, and carpooling for commute and other work-related trips. The City shall provide information on these and other applicable programs to all employees.
- **CAQ-26-Action 2:** All City facilities shall incorporate energy-conserving design and construction techniques.
- **CAQ-26-Action 3:** The City shall encourage City contractors and vendors to reduce emissions from their operations (such as by using low emission vehicles), and shall consider including a preference for low emission contractors and vendors in City requests for proposals where appropriate.
- **Policy CAQ-27:** The City shall promote energy conservation measures in new development to reduce on-site emissions and power plant emissions. The City shall seek to reduce the energy impacts from new residential and commercial projects through investigation and implementation of energy efficiency measures during all phases of design and development.
- **CAQ-27-Action 1:** Provide information to the public and builders on available energy conservation techniques and products.
- **CAQ-27-Action 2:** Encourage the use of trees planted in locations that will maximize energy conservation and air quality benefits. Encourage the use of landscaping materials which produce lower levels of hydrocarbon emissions.
- **CAQ-27-Action 3:** During project review, City staff shall consider energy conservation and, where appropriate, suggest additional energy conservation techniques.
- **CAQ-27-Action 4:** During project review, ensure that "Best Available Control Technology" is properly used and implemented.
- **CAQ-27-Action 5:** Encourage new commercial uses to limit delivery hours to nonpeak hours.

- **Policy CAQ-28:** The City shall emphasize “demand management” strategies which seek to reduce single-occupant vehicle use in order to achieve state and federal air quality plan objectives.
- **CAQ-28-Action 1:** Implement the requirements for designated carpool and vanpool parking for all new office developments.
- **CAQ-28 Action 2:** All City facilities shall include designated carpool and vanpool spaces, and all City staff shall be encouraged to take part in ridesharing.
- **Policy CAQ-29:** The City shall seek to ensure that public transit is a viable and attractive alternative to the use of private motor vehicles.
- **CAQ-29-Action 1:** Consider implementation of a development impact fee to provide funding for the development of new public transit facilities in Elk Grove.
- **CAQ-29-Action 2:** The City shall review all options for providing public transit to the residents and businesses of Elk Grove and seek to implement the option which provides the most effective and cost-efficient service.
- **Policy CAQ-30:** All new development projects which have the potential to result in substantial air quality impacts shall incorporate design, construction, and/or operational features to result in a reduction in emissions equal to 15 percent compared to an “unmitigated baseline” project. An “unmitigated baseline project” is a development project which is built and/or operated without the implementation of trip-reduction, energy conservation, or similar features, including any such features which may be required by the Zoning Code or other applicable codes.
- **CAQ-30-Action 1:** The City shall develop and implement “Emission Reduction Measures” to achieve the reduction required by this policy. These Emission Reduction Measures should consider the following:
 - Cost-effectiveness
 - A maximum cost for measures, and consideration of a waiver from full compliance if this maximum cost would be exceeded.
 - Credits for emission reductions already in place (e.g., for buildings in the latter phases of a multi-phased project which included emission reduction measures in its design) or which are required to mitigate other impacts.
- **Policy CAQ-31:** The City shall support intergovernmental efforts directed at stringent tailpipe emission standards and inspection and maintenance programs for all feasible vehicle classes and revisions to the Air Quality Attainment Plan to accelerate and strengthen market-based strategies consistent with the General Plan.
- **CAQ-31-Action 1:** The City shall ensure that all City vehicles conform with applicable emission standards and the time of purchase and continuing throughout their use by the City. The City shall consider pollutant emissions as one criterion for vehicle purchasing decisions, seeking to purchase lower-emitting vehicles.

- **CAQ-31-Action 2:** The City shall participate in intergovernmental groups seeking to improve local and regional air quality.
- **CAQ-31-Action 3:** In conjunction with Sacramento Metropolitan Air Quality Management District, support and participate in a public education and outreach program dealing with air quality issues, with a goal of attaining a solid foundation of public support for needed air quality measures.
- **CAQ-31-Action 4:** The City shall consider the adoption of an ordinance to discourage excessive idling of diesel-powered and other heavy vehicles to reduce air pollutant emissions.
- **Policy CAQ-32:** As part of the environmental review of projects, the City shall identify the air quality impacts of development proposals to avoid significant adverse impacts and require appropriate mitigation measures, potentially including—in the case of projects which may conflict with applicable air quality plans—emission reductions in addition to those required by Policy CAQ-30.
- **CAQ-32-Action 1:** Coordinate with the Sacramento Metropolitan Air Quality Management District on the review of proposed development projects, specifically including projects that could conflict with any applicable air quality plans and/or the State Implementation Plan.
- **Policy CAQ-33:** The City shall require that public and private development projects use low emission vehicles and equipment as part of project construction and operation, unless determined to be infeasible.
- **Policy SA-10:** Industries which store and process hazardous or toxic materials shall provide a buffer zone between the installation and the property boundaries sufficient to protect public safety. The adequacy of the buffer zone shall be determined by the City of Elk Grove.
- **Policy CI-4:** Specific Plans, Special Planning Areas, and development projects shall be designed to promote pedestrian movement through direct, safe, and pleasant routes that connect destinations inside and outside the plan or project area.
- **Policy CI-8:** The City shall encourage the extension of bus rapid transit and/or light rail service to the planned office and retail areas north of Kammerer Road and west of Hwy 99.
- **Policy CI-13:** The City shall require that all roadways and intersections in Elk Grove operate at a minimum Level of Service “D” at all times.
- **Policy CI-15:** Development projects shall be required to provide funding or to construct roadway/intersection improvements to implement the City’s Circulation Master Plan. The payment of established traffic impact or similar fees shall be considered to provide compliance with the requirements of this policy with regard to those facilities included in the fee program, provided that the City finds that the fee adequately funds all required roadway and intersection improvements. If payment of established fees is used to provide compliance with this policy, the City may also require the payment of additional fees if necessary to cover the fair share cost of facilities not included in the fee program.

3.3.4 - Methodology

Methodology for Analysis

The SMAQMD updated its CEQA Guide to Air Quality Assessment in 2009, with additional revisions in April and June of 2011. The updated document includes chapters for project-level analysis and the chapter Program-Level Analysis of General and Area Plans. However, the SOIA would allow the City of Elk Grove to file annexation requests for lands within the SOIA Area, and could indirectly lead to urbanization of the area. Therefore, the analysis utilizes the SMAQMD's guidance to the extent practicable, and examines the project in relationship to Appendix G, Environmental Checklist, of the CEQA Guidelines air quality impact questions.

Operational on-road mobile emissions for the potential future development of the project based on the land use assumptions provided in Section 2.2 were modeled using EMFAC2007.

3.3.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, air quality impacts resulting from the implementation of the proposed project would be considered significant if the project would:

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Would the project:

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

3.3.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Air Quality Plan

Impact AIR-1: **The project would not conflict with or obstruct implementation of the applicable air quality plan.**

Impact Analysis

The SMAQMD's CEQA Guide recommends evaluation of the following three criteria for determining potential significance for consistency with the applicable air quality plan:

1. The plan's consistency with both the Sacramento Regional Ozone Attainment Plan and SACOG's Metropolitan Transportation Plan population growth projections;
2. The relationship between the plan's projected vehicle miles traveled (VMT) and population growth (i.e., whether the two projections are proportional or whether the VMT increases at a slower rate than population, indicating a successful mode shift); and
3. The extent to which the plan implements OAP transportation control measures.

The project does not include changes to land use, or general plan goals and policies. In addition, no specific land use entitlements, specific development proposals, or land development activity are proposed at this time in conjunction with the proposed SOIA. The policies and provisions of the County's General Plan, zoning code, and other land use regulations would continue to be in effect; no land use designations, redesignations or rezoning, or any other modifications or extensions of existing General Plans or area plans is proposed. Therefore, the project would not directly result in air quality impacts. It is important to note that the City may begin comprehensive planning for the area after approval of the SOIA. However, it is currently unknown when comprehensive planning would be undertaken by the City. The proposed project does have the potential to indirectly affect consistency with applicable air quality plans through the potential for future urbanization of the SOIA Area.

The proposed project would involve the extension of the City of Elk Grove's SOI to include the 7,869-acre project site. As stated in Section 2.2, the City calculated anticipated growth and land needs outside its existing SOI based on its understanding of the SACOG MTP for 2035. The City expects that it would require a total of 5,327 acres outside of the city limits to accommodate the projected job and housing growth to 2035. The project area contains a calculated 6,882 acres of developable area. Therefore, the project site contains 1,555 acres of developable land, or approximately 29 percent, more than is needed to accommodate the expected job and housing growth required of the City.

As stated in Section 2, land use assumptions were developed for this EIR with the intent to provide a general program level concept of growth that may result from future development in the SOIA Area, and allow LAFCo to understand probable future and potential environmental effects that may result from future anticipated growth.

The Transportation Impact Study prepared by Fehr and Peers calculated that full buildout of the SOIA Area under the assumed conceptual land uses provided in Section 2.2 would result in approximately 218,000 trips per day and 1,389,072 daily vehicle miles traveled (VMT). All calculations are based on the conceptual land uses. As noted above, a portion of these trips, and associated VMT, would be generated by growth planned for and analyzed within the SMAQMD's Regional Ozone Attainment Plan and SACOG's MTP. It may be assumed that roughly 60 percent of the trips and VMT would be generated by planned growth, whereas approximately 30 percent of the trips would generate additional growth accommodated by the developable land within the SOIA Area that is in excess of the City's calculated land needed for anticipated growth.

The project site contains an excess of land beyond what is estimated as required to accommodate anticipated growth. As shown in Impact AIR-3, the project's assumed growth would result in indirect generation of mobile trips that would emit approximately 2.43 tons per day (tpd) of ROG, 9.17 tpd NO_x, and 0.67 tpd of PM₁₀ in 2035. Therefore, future planning actions and annexations have the potential to conflict with the adopted air quality plan by resulting in an increase in population and/or VMT above what was anticipated by the SMAQMD and SACOG. As stated in Section 2.2, state planning law provides that a city may comprehensively plan for lands outside of its jurisdiction. As stated above, the City would conduct comprehensive planning for the area at an unknown future date. Therefore, mitigation is proposed for the City of Elk Grove to prepare and evaluate a comprehensive plan for development of the project site that is consistent with the applicable air quality plan and MTC prior to incorporation of land into the City. Implementation of Mitigation Measure AIR-1a or AIR-1b would reduce this impact to less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-1a The goal of this mitigation measure is to avoid air quality impacts by ensuring that the Elk Grove Sphere of Influence Amendment (SOIA) Area meets or exceeds the air pollution control requirements in the federally mandated State Implementation Plan for the Sacramento Ozone Non-attainment Area (SIP), which consists of all or parts of Yolo, Solano, El Dorado, Placer, Sutter, and Sacramento counties, including the City of Elk Grove and the SOIA Area.

At the time of submittal of any application to annex territory within the SOIA Area, the City of Elk Grove will prepare an Air Quality Mitigation Plan.

- a. The Plan must reduce the SOIA Area's operational ozone precursor emissions by 35 percent when compared with the potential emissions that could occur in the SOIA in the absence of the policies and measures included in the AQMP.

- b. The City of Elk Grove will coordinate the development of the Air Quality Mitigation Plan with the SMAQMD and SACOG, and will use modeling tools approved by those agencies to gauge the effectiveness of the measures.

OR

MM AIR-1b (Alternative air quality mitigation): The AQMP required under Mitigation Measure AIR-1 will be required to demonstrate a 15-percent reduction in ozone precursor emissions if the following conditions are met:

- a. The application for annexation of the SOIA Area or any portion thereof occurs after the June 15, 2019 SIP attainment deadline, and the SMAQMD confirms the ozone standards have been achieved.
- b. The City of Elk Grove demonstrates that the development proposal is consistent with the new SIP or attainment plan and the SMAQMD concurs with the analysis. If the demonstration uses modeling tools, the tools must be approved by SMAQMD and SACOG.

Level of Significance After Mitigation

Less than significant impact.

Air Quality Standards

Impact AIR-2: **The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.**

Impact Analysis

This impact is related to localized criteria pollutant impacts because criteria pollutants are the pollutants with ambient air quality standards. Potential localized impacts would be exceedances of state or federal standards for PM_{2.5}, PM₁₀, or CO. Such localized exceedances are also called ‘hotspots’. Because the potential for PM_{2.5}, PM₁₀ hotspots is dependant on project-level details, such as the intensity, location, duration and components of development, it is not feasible to estimate the project’s potential for PM_{2.5}, PM₁₀ hotspot generation. However, the Transportation Impact Study prepared by Fehr and Peers was reviewed for use estimating CO hotspots.

Project emissions may be considered significant if a CO hotspot intersection analysis determines that project-generated emissions cause a localized violation of the state CO 1-hour standard of 20 ppm, state CO 8-hour standard of 9 ppm, federal CO 1-hour standard of 35 ppm, or federal CO 8-hour standard of 9 ppm.

Because increased CO concentrations are usually associated with roadways that are congested and with heavy traffic volume, the SMAQMD has established that preliminary screening can be used to determine with fair certainty that the effect a project has on any given intersection would not cause a

potential CO hotspot. Therefore, the SMAQMD has established that if all project-affected intersections are negative for both of the following criteria, then the project can be said to have no potential to create a violation of the CO standard:

- Traffic generated by the proposed project would not result in the 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 either of the criteria can be associated with any intersection affected by the project, a CO Protocol Analysis must be prepared to determine significance. The Transportation Impact Study prepared by Fehr and Peers contains two analysis scenarios— existing plus project (year 2010), and cumulative conditions (year 2035)— utilizing the land use assumptions provided in Section 2, Project Description. The Transportation Impact Study reviewed impacts to roadway segments, but did not include impact analysis of intersections. As stated in the Transportation Impact Study:

Due to the general nature of the land use development assumptions for buildout of the proposed project, the transportation analysis is not, and cannot, be as detailed as subsequent future project specific annexation and development proposals that will ultimately be required.

Therefore, there is no intersection LOS data to conduct a CO hotspot analysis, and the ability to forecast the level of detail required to conduct a CO hotspot is not feasible.

As discussed above, land use assumptions were developed for this EIR with the intent to provide a general program level concept of growth that may result from future development in the SOIA Area, and allow LAFCo to understand possible future and potential environmental effects that may result from future anticipated growth. Although land use assumptions are conceptual only, the project has the potential to result in a significant indirect impact through allowing future urbanization of the project area. Implementation of Mitigation Measure AIR-2 would reduce the potential to less than significant by requiring future development to implement the SMAQMD's recommended CO hotspot screening and analysis procedures, and requiring project-specific mitigation to reduce identified potentially significant impacts.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-2 At the time of submittal of any application to annex territory within the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall demonstrate that the

SMAQMD’s most current guidance on the screening and assessment of CO, PM₁₀, and PM_{2.5} hotspots will be implemented for all development proposals within the SOIA Area. In addition, the City of Elk Grove shall demonstrate that sufficient mitigation shall be required of all identified potentially significant CO, PM₁₀, and PM_{2.5} hotspots to reduce the impact to less than significant.

Level of Significance After Mitigation

Less than significant impact.

Criteria Pollutants in Nonattainment Area

Impact AIR-3: **The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).**

Impact Analysis

The non-attainment pollutants of concern for this impact are ozone, PM₁₀ and PM_{2.5}. Ozone is not emitted directly into the air, but is a regional pollutant formed by a photochemical reaction in the atmosphere. Ozone precursors, ROG and NO_x, react in the atmosphere in the presence of sunlight to form ozone. Therefore, the SMAQMD does not have a recommended ozone threshold, but has regional thresholds of significance for project-emitted NO_x and ROG.

The Transportation Impact Study prepared by Fehr and Peers calculated that full buildout of the SOIA Area under the assumed conceptual land uses provided in Section 2.2 would result in approximately 218,000 trips per day and 1,389,072 daily vehicle miles traveled (VMT). EMFAC2007, BURDEN, was used to calculate future ROG, NO_x, and PM₁₀ emissions for the year 2020, 2030, and 2035. EMFAC output is provided as Appendix B to this EIR. As shown in Table 3.3-5, buildout of the SOIA Area under the assumed conceptual land uses would result in approximately 2.43 tons per day (tpd) of ROG, 9.17 tpd NO_x, and 0.67 tpd of PM₁₀ in 2035. As stated in Impact AIR-1, roughly 60 percent of the SOIA developable area would accommodate growth anticipated for the City in the Sacramento Regional Ozone Attainment Plan and MTC 2035.

Table 3.3-5: Indirect Mobile Emissions

Year of Analysis	Tons per Day		
	ROG	NO _x	PM ₁₀
2020	5.28	14.45	0.94
2025	3.61	11.71	0.77
2035	2.43	9.17	0.67

Source: Michael Brandman Associates, 2011. Appendix B.

As previously indicated, the project would not directly result in the creation of any new emission sources when compared with existing conditions; therefore, the project would not result in a direct cumulatively considerable net increase of any criteria pollutant. However, as discussed in Impact AIR-1, the developable portion of the project site is approximately 1,555 acres larger than the City needs to accommodate anticipated growth. Therefore, although no specific development proposals or land use changes are proposed as part of this project, the project would allow future incorporation and development of the project site that could result in emissions greater than that anticipated by the SMAQMD's attainment plans and SACOG MTC. As such, the project has the potential to result in a substantial increase in nonattainment pollutants; specifically, ozone precursors. However, implementation of Mitigation Measure AIR-1a or AIR-1b would reduce this impact to less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measure AIR-1a or AIR-1b.

Level of Significance After Mitigation

Less than significant impact.

Sensitive Receptors

Impact AIR-4:	The project would not expose sensitive receptors to substantial pollutant concentrations.
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Impact Analysis

Similar to Impact AIR-2, this impact is related to site-specific, or localized, impacts. The potential for impacting sensitive receptors is dependant on project-level details, such as the intensity, location, duration and components of development. However, the proposed project may result in an indirect effect because it would allow future urbanization of the SOIA Area. Therefore, the project may indirectly result in sensitive receptors being located within close proximity of pollution sources, such as high-volume roadways, industrial uses, point sources (such as fuel stations), or other potential source of substantial pollution concentrations. Future specific development proposal must be evaluated for potential air quality impacts. As such, analysis of sensitive receptor impacts would be conducted when development is proposed.

As stated in the Regulatory Framework, the ARB has published the Land Use Handbook, which contains advisory recommendations on siting new sensitive receptors near sources of TACs. The Land Use Handbook's siting recommendations are shown in Table 3.3-6.

Table 3.3-6: Land Use Handbook Guidance on Siting New Sensitive Receptors

Source Category	Advisory Recommendations
Freeways and High-Traffic Roads	Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.
Refineries	Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.
Gasoline Dispensing Facilities	Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.
Notes: The Land Use Handbook states: x These recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues. Source: ARB 2005.	

As shown in Exhibit 3.15-1 and Exhibit 3.15-4, State Route 99 and Interstate 5 would not meet or exceed the 100,000 vehicles/day criteria used in the Handbook’s guidance in the existing conditions

or the cumulative plus project conditions. In addition, the main roads through the SOIA Area would not meet or exceed the 50,000 vehicles/day criteria used in the Handbook's guidance in the existing conditions or the cumulative plus project conditions.

However, because the project may indirectly result in future urbanization of the SOIA Area, mitigation is proposed to provide a comprehensive plan for avoiding impacts to existing as well as future sensitive receptors on the project site. Implementation of Mitigation Measure AIR-4 would reduce this impact to less than significant by avoiding placement of sensitive receptors near sources of substantial TACs.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-4 At the time of submittal of any application to annex territory within the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall review existing sources of toxic air contaminants in and around the project site, including (but not limited to): State Route 99, rail lines, California Air Resources Board or Sacramento Metropolitan Air Quality Management District-permitted point-sources, warehouse operations and similar sources of heavy-duty truck trips. The City will adopt appropriate distance buffers to be applied between sources of toxic air contaminants and sensitive receptor land uses. Future development proposals that would result in the location of sensitive land uses closer to sources of toxic air contaminants than the adopted buffer distances shall require a detailed Health Risk Assessment to determine if significant impacts would occur, and include mitigation measures if necessary to reduce impacts to less than significant levels.

Level of Significance After Mitigation

Less than significant impact.

Odors

Impact AIR-5: **The project would not create objectionable odors affecting a substantial number of people:**

Impact Analysis

As previously indicated, the project would not result in any changes to existing land use patterns or to the current baseline conditions with regard to existing sources of odors. Existing odor sources are located throughout the project area, including a confined animal feeding operations within and adjacent to the western portion of the SOIA Area. It is unknown if these existing uses would continue to operate in the future, or if additional sources of odor would be proposed as part of potential urbanization within the SOIA Area. However, because the project may indirectly result in future urbanization of the project area, the project may indirectly result in receptors being located within

Air Quality

close proximity of odor sources. Therefore, mitigation is proposed to avoid impacts potential odor impacts. Implementation of Mitigation Measure AIR-5 would reduce this impact to less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-5 At the time of submittal of any application to annex territory within the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall review existing sources of odor in and around the project site, including (but not limited to) any land use referenced in Sacramento Metropolitan Air Quality Management District CEQA Guidance document as an odor-generating land use. The City will adopt and apply appropriate distance buffers between existing sources of odor and receptor land uses in the SOIA Area.

Level of Significance After Mitigation

Less than significant impact.