3.3 AIR QUALITY

This section describes the existing local and regional air quality conditions; summarizes applicable air quality regulations; and addresses potential air quality impacts attributable to the proposed project.

3.3.1 ENVIRONMENTAL SETTING

The Kammerer Road/Highway 99 SOIA Area (SOIA Area) is located south of the city of Elk Grove within the southern portion of the Sacramento Valley Air Basin (SVAB).

CLIMATE AND METEOROLOGY OF THE SACRAMENTO VALLEY AIR BASIN

The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Existing air quality conditions in the SOIA Area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed below.

Air quality is defined by the concentration of pollutants in relation to their impact on human health. Concentrations of air pollutants are determined by the rate and location of pollutant emissions released by pollution sources, and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, and sunlight. Therefore, ambient air quality conditions within the local air basin are influenced by topography, meteorology, and climate, in addition to the amount of air pollutant emissions released by existing air pollutant sources.

The SVAB is relatively flat and is bounded by North Coast Ranges on the west and the Sierra Nevada Mountain Range on the east. These mountain ranges reach heights in excess of 6,000 feet with peaks rising much higher. This provides a substantial physical barrier to locally created pollution, as well as pollution that might otherwise be transported northward on prevailing winds from the Sacramento Metropolitan area. Although a significant portion of the SVAB is located at an elevation of more than 1,000 feet above sea level, the vast majority of its populace lives and works below that elevation. The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems.

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

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

or temperature inversions, which hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

May through October is ozone season in the SVAB. This period is characterized by poor air movement in the mornings and the arrival of the Delta sea breeze from the southwest in the afternoons. Longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_X), which result in ozone formation.

The local meteorology of the area is represented by measurements recorded at the Sacramento Executive Airport weather station (Station 047630), located roughly 15 miles northwest of the SOIA Area (Western Regional Climate Center 2016). The monthly average temperatures are recorded at this station between 1941 and 2016. January temperatures range from a normal minimum of 38°F to a normal maximum of 54°F. July temperatures range from a normal minimum of 58°F to a normal maximum of 93°F. The annual average temperature for this station is 73.6°F. December, January, and February typically are the coldest months in this area. Rainfall mostly occurs between November and March, with an average of approximately 17 inches per year.

CRITERIA POLLUTANTS

The California Air Resources Board (ARB) and the U.S. Environmental Protection Agency (EPA) 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 with aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), and lead. These pollutants, which are most linked with human health, are called "criteria air pollutants."

Health-based air quality standards have been established for these pollutants by ARB at the state level and by EPA at the national level. These standards, which include a margin of safety, were established to protect the public from adverse health impacts resulting exposure to air pollution. California also has established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. A brief description of each criteria air pollutant, including its source types and health effects, is provided below, along with the most current monitoring station data and attainment designations for the SOIA Area.

Ozone

Ozone (O_3) is the principal component of smog and is formed in the atmosphere through a series of reactions involving ROG and NO_X in the presence of sunlight. ROG and NO_X are called precursors of ozone. NO_X includes various combinations of nitrogen and oxygen, including nitric oxide (NO), NO_2, and others. Ozone is a principal cause of lung and eye irritation in the urban environment. Significant ozone concentrations are usually produced only in the summer, when atmospheric inversions are greatest and temperatures are high. ROG and NO_X emissions are both considered critical in ozone formation.

The rate of ozone production can be limited by either ROGs or NO_X. When there is a lower production rate of NO_X, indicating that NO_X is scarce, the rate of ozone production is NO_X-limited. In this case, ozone can be most effectively reduced by lowering current and future NO_X emissions, rather than lowering ROGs. Rural areas tend to be NO_X-limited, while areas with a dense urban population tend to be ROG-limited. The SOIA Area is in a relatively rural setting, which suggests it is NO_X-limited. The Sacramento region is generally considered to be NO_X limited (BAAQMD 2009).

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible sub-groups for ozone effects. Short-term exposure (lasting for a few hours) to ozone can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in communities with high ozone levels.

Carbon Monoxide

CO is a colorless and odorless gas that, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called "hot spots," which can be hazardous to human receptors adjacent to the intersections.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of decreased oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport. Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia (oxygen deficiency) as seen at high altitudes.

Nitrogen Oxides

NO_X emissions are primarily generated from the combustion of fuels. Nitrogen oxides include NO and NO_2. NO_2 is formed when ozone reacts with NO in the atmosphere and is listed as a criteria pollutant because NO_2 is the more toxic than NO. NO_2 is a product of combustion and is generated in vehicles and in stationary sources, such as power plants and boilers. NO_2 is a principal contributor to ozone and smog generation and can provoke lung irritation and lung damage.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children, is associated with long-term exposure to NO_2 at levels found in homes with gas stoves, which are even higher than ambient levels found in southern California (known as a high ozone area). Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups.

Sulfur Dioxide

SO_2 is a combustion product, with the primary source being power plants and heavy industries that use coal or oil as fuel. SO_2 is also a product of diesel engine combustion. SO_2 in the atmosphere contributes to the formation of acid rain.

In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, are observed after acute exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

Lead

Lead is a highly toxic metal that may cause a range of human health effects. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere. Environmental Protection Agency (EPA) began working to reduce lead emissions soon after its inception, issuing the first reduction standards in 1973. Lead emissions have significantly decreased due to the near elimination of leaded gasoline use.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure. Lead poisoning can cause anemia, lethargy, seizures, and death; although it appears that there are no direct effects of lead on the respiratory system.

Particulate Matter

Particulate matter is a complex mixture of extremely small particles and liquid droplets. Particulate matter is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Natural sources of particulate matter include windblown dust and ocean spray. The size of particulate matter is directly linked to the potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller, because these particles generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects and even death.

Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children. The size of particles is directly linked to the potential for causing health problems. Small particles less than 10 µm in diameter, or p.m. 10, microns in diameter (PM_{10}) pose a big problem, because they can get deep into lungs and the bloodstream. Being even smaller, $PM_{2.5}$ will travel further into the lungs. Exposure to such particles can affect both lungs and heart. Numerous scientific studies have linked part particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing. EPA groups particulate matter into two categories, which are described below.

Particulate Matter less than 10 Microns

Particulate matter with a diameter of 10 microns or less is referred to as PM_{10}. PM_{10} includes both fine and coarse dust particles; the fine particles are $PM_{2.5}$. Coarse particles, such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter. Sources of coarse particles include crushing or grinding operations and dust from paved or unpaved roads. Control of PM_{10} is primarily achieved through the control of dust at construction and industrial sites, the cleaning of paved roads, and the wetting or paving of frequently used unpaved roads.

Fine Particulate Matter less than 2.5 Microns

Fine particulates, such as those found in smoke and haze, are $PM_{2.5}$. Sources of fine particles include all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. $PM_{2.5}$ is also formed through reactions of gases, such as SO_2 and nitrogen oxides, in the atmosphere. $PM_{2.5}$ is the major cause of reduced visibility (haze) in California.

AMBIENT AIR QUALITY STANDARDS

Health-based air quality standards have been established for these criteria pollutants by EPA at the national level and by ARB at the state level. These standards were established to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution. In addition to criteria pollutants, California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. Table 3.3-1 presents the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS). These health-based pollutant standards are reviewed on a legally prescribed frequency and revised as new health and welfare effects data warrant. Each standard is based on a specific averaging time over which the concentration is measured. Different averaging times are based upon protection of short-term, high-dosage effects or longer-term, low-dosage effects. NAAQS may be exceeded no more than once per year; CAAQS are not to be exceeded.

SACRAMENTO VALLEY AIR BASIN EXISTING AIR QUALITY

Ambient air pollutant concentrations in the SMVAB are measured at 12 air quality monitoring stations. The air quality monitoring station closest to the proposed SOIA Area is the Elk Grove – Bruceville Road monitoring station, located at 12490 Bruceville Road, Elk Grove, California, 95757. Table 3.3-2 presents the most recent data over the past 3 years from the Elk Grove – Bruceville Road monitoring station, with a summary of the exceedances of standards and the highest pollutant levels recorded for the years 2013 through 2015. These concentrations represent the existing, or baseline conditions, for the proposed project, based on the most recent information available.

As shown in Table 3.3-2, ambient concentration of NO_2 at the Elk Grove – Bruceville Road monitoring station has not exceeded the NAAQS or CAAQS in the past 3 years. The eight-hour ozone concentration exceeded the CAAQS two times in 2014 and 2015. The eight-hour ozone concentration exceeded the NAAQS only once in 2015. The one-hour ozone concentration has not exceeded the CAAQS in the past three years. Although the 24-hour $PM_{2.5}$ concentration has exceeded the NAAQS, the annual averages have remained well below the standard.

Table 3.3-1. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [a]	National Standards [b]	
		Concentration [c]	Primary [c,d]	Secondary [c,e]
Ozone [k]	1 hour	0.09 ppm (180 µg/m^3)	–	Same as primary standard
	8 hours	0.070 ppm (137 µg/m^3)	0.070 ppm (147 µg/m^3)	
Respirable particulate matter (PM_{10}) [f]	24 hours	50 µg/m^3	150 µg/m^3	Same as primary standard
	Annual arithmetic mean	20 µg/m^3	–	
Fine particulate matter ($PM_{2.5}$) [f]	24 hours	–	35 µg/m^3	Same as primary standard
	Annual arithmetic mean	12 µg/m^3	12 µg/m^3	15 µg/m
Carbon monoxide (CO)	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
	8 hours (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
Nitrogen dioxide (NO_2) [g]	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard
	1 hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	None
Sulfur dioxide (SO_2) [h]	Annual Arithmetic Mean	–	0.030 ppm (for certain areas) [h]	–
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas) [h]	–
	3 hours	—	–	0.5 ppm (1,300 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	–
Lead [i, j]	30-day average	1.5 µg/m^3	–	–
	Calendar quarter	–	1.5 µg/m^3 (for certain areas) [j]	Same as primary standard
	Rolling 3-month average	–	0.15 µg/m^3	
Visibility-reducing particles [k]	8 hours	See footnote j	No national standards	
Sulfates	24 hours	25 µg/m^3		
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m^3)		
Vinyl chloride [i]	24 hours	0.01 ppm (26 µg/m^3)		

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

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility-reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on 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 measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour 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. 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 standards.

[c] Concentration expressed first in the units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celsius and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and reference pressure of 760 torr; (ppm) in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

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

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

[f] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[g] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from 100 ppb to 0.100 ppm.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. To directly compare the 1-hour national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical of 0.075 ppm.

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

[j] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standards are approved.

[k] In 1989, ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and the "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

[k] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

Source: ARB 2016

Table 3.3-2. Ambient Air Quality Summary – Elk Grove – Bruceville Road Air Monitoring Station			
Pollutant Standards	2013	2014	2015
Nitrogen Dioxide (NO_2)			
National maximum 1-hour concentration (ppb)	38.0	54.0	29.0
State maximum 1-hour concentration (ppb)	38.0	54.0	29.0
Number of Days Standard Exceeded			
NAAQS 1-hour	0	0	0
CAAQS 1-hour	0	0	0
Ozone			
National maximum 8-hour concentration (ppm)	0.068	0.072	0.082
State maximum 1-hour concentration (ppm)	0.086	0.089	0.091
State maximum 8-hour concentration (ppm)	0.069	0.072	0.082
Number of Days Standard Exceeded			
CAAQS 1-hour (>0.09 ppm)	0	0	0
CAAQS 8-hour (>0.07 ppm)/NAAQS 8-hour (>0.07 ppm)	0/0	2/0	2/1
Particulate Matter ($PM_{2.5}$)			
National maximum 24-hour concentration ($\mu g/m^3$)	*	*	*
State maximum 24-hour concentration ($\mu g/m^3$)	38.0	52.2	36.5
National annual average concentration ($\mu g/m^3$)	*	*	*
State annual average concentration ($\mu g/m^3$)	8.2	10.5	12.3
Measured Number of Days Standard Exceeded			
NAAQS 24-hour (>35 $\mu g/m^3$)	*	*	*

*Insufficient data to determine the value.
Source: ARB 2015.

SACRAMENTO COUNTY ATTAINMENT STATUS

Both EPA and ARB use ambient air quality monitoring data to designate areas according to their attainment status for criteria air pollutants. 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 re-designated as attainment must develop and implement maintenance plans, which are designed to ensure continued compliance with the standard.

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 insufficient data exist to determine attainment or nonattainment. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment.

As shown in Table 3.3-3, Sacramento County currently meets NAAQS for all criteria air pollutants except ozone, and the 24-hour $PM_{2.5}$ standard. Sacramento County meets the CAAQS for all criteria air pollutants except ozone, PM_{10}, and $PM_{2.5}$.

Table 3.3-3. Sacramento County Attainment Designations

Pollutant	Federal Standard	California Standard
Ozone (O_3)[1]	Nonattainment (1-hour) [1] Classification = Severe	Nonattainment (1-hour) Classification = Serious[2]
	Nonattainment (8-hour) [3] Classification = Severe-15	Nonattainment (8-hour)
	Nonattainment (8-hour) [4] Classification = Severe-15	
Particulate Matter – 10 microns (PM_{10})	Attainment (24-hour)	Nonattainment (24-hour)
		Nonattainment (Annual)
Particulate Matter – 2.5 microns ($PM_{2.5}$)	Nonattainment (24-hour)	(No Standard for 24-hour)
	Unclassified/Attainment (Annual)	Nonattainment (Annual)
Carbon Monoxide (CO)	Attainment (1-hour)	Attainment (1-hour)
	Attainment (8-hour)	Attainment (8-hour)
Nitrogen Dioxide (NO_2)	Unclassified/Attainment (1-hour)	Attainment (1-hour)
	Unclassified/Attainment (Annual)	Attainment (Annual)
Sulfur Dioxide (SO_2) [5]	(Attainment Pending) (1-hour)	Attainment (1-hour)
		Attainment (24-hour)
Lead (Pb)	Unclassified/Attainment (3-month rolling avg)	Attainment (30 day average)
Hydrogen Sulfide (H_2S)	No Federal Standard	Unclassified (1-hour)
Sulfates		Attainment (24-hour)
Visibly Reducing particles		Unclassified (8-hour)

[1] Air quality meets Federal 1-hour Ozone standard (77 FR 64036). EPA revoked this standard, but some associated requirements still apply. The SMAQMD attained the standard in 2009. SMAQMD has requested EPA recognize attainment to fulfill the requirements.

[2] Per Health and Safety Code (HSC) § 40921.5(c), the classification is based on 1989–1991 data, and therefore does not change.

[3] 1997 Standard.

[4] 2008 Standard.

[5] Cannot be classified.

Source: SMAQMD 2016a

TOXIC AIR CONTAMINANTS

In addition to criteria pollutants, both federal and state air quality regulations also focus on toxic air contaminants (TACs). TACs can be separated into carcinogens and noncarcinogens, 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. Any exposure to a carcinogen poses some risk of contracting cancer. Noncarcinogens 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.

TACs may be emitted by stationary, area, or mobile sources. Common stationary sources of TAC emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to local air district permit requirements. The other, often more significant, sources of TAC emissions are motor vehicles on freeways, high-volume roadways, or other areas with high numbers of diesel vehicles, such as distribution centers. Off-road mobile sources are also major contributors of TAC emissions and include construction equipment, ships, and trains.

Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by ARB in 1998. Federal and state efforts to reduce diesel PM emissions have focused on the use of improved fuels, adding particulate filters to engines, and requiring the production of new-technology engines that emit fewer exhaust particulates.

Diesel engines tend to produce a much higher ratio of fine particulates than other types of internal combustion engines. The fine particles that make up diesel PM tend to penetrate deep into the lungs and the rough surfaces of these particles makes it easy for them to bind with other toxins within the exhaust, thus increasing the hazards of particle inhalation. Long-term exposure to diesel PM is known to lead to chronic, serious health problems including cardiovascular disease, cardiopulmonary disease, and lung cancer.

ODOR

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

The ability to detect odors varies considerably among the population and is subjective. Some individuals have the ability to smell minute quantities of specific substances while others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person (e.g., from a fast-food restaurant or bakery) may be perfectly acceptable to another. Unfamiliar odors may be more easily detected and likely to cause complaints than familiar ones.

Several examples of common land use types that generate substantial odors include wastewater treatment plants, landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants. In addition, agricultural activities in the area can cause odors, such as dairy operations; horse, cattle, or sheep (livestock) grazing; fertilizer use; and aerial crop spraying.

Offensive odors can potentially affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, the ROGs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects, such as stress.

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 include children, the elderly, people with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Air quality regulators typically define sensitive receptors as schools, hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality.

Residential areas are also 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 exposure to 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 are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial 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.

3.3.2 REGULATORY FRAMEWORK

FEDERAL PLANS, POLICIES, REGULATIONS AND LAWS

The primary legislation that governs federal air quality regulations is the Clean Air Act (CAA) Amendments of 1990. The act delegates primary responsibility for clean air to EPA. EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the act, EPA has established the NAAQS for seven potential air pollutants: CO, O_3, NO_2, PM_{10} and $PM_{2.5}$, SO_2, and lead. The purpose of the NAAQS is two-tiered: primarily to protect public health, and secondarily to prevent degradation to the environment (i.e., impairment of visibility, damage to vegetation and property).

STATE PLANS, POLICIES, REGULATIONS AND LAWS

ARB is the lead agency for developing the State Implementation Plan in California. The State Implementation Plan (SIP) is prepared by each sate describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. Local air districts and other agencies prepare Air Quality Attainment Plans or Air Quality Management Plans (AQMPs), and submit them to ARB for review, approval, and incorporation into the applicable State Implementation Plan. ARB also maintains air quality monitoring stations throughout the state in conjunction with local air districts. Data collected at these stations are used by the ARB to classify air basins as being in attainment or nonattainment with respect to each pollutant and to monitor progress in attaining air quality standards.

The California CAA requires that each area exceeding the CAAQS for ozone, CO, SO_2, and NO_2 must develop a plan aimed at achieving those standards. The California Health and Safety Code Section 40914, requires air districts to design a plan that achieves an annual reduction in district-wide emissions of 5 percent or more, averaged every consecutive 3-year period. To satisfy this requirement, the local air districts have to develop and implement air pollution reduction measures, which are described in their AQMPs, and outline strategies for achieving the CAAQS for any criteria pollutants for which the region is classified as nonattainment.

ARB has established emission standards for vehicles sold in California and for various types of equipment. California gasoline specifications are governed by both State and federal agencies. During the past decade, federal and State agencies have imposed numerous requirements on the production and sale of gasoline in California. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. As such, engine manufacturers are now required to meet after-treatment-based exhaust standards for NO_X and PM starting in 2011 that are more than 90% lower than current levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines. ARB has also adopted control measures for diesel PM 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).

TACs in California are regulated primarily through the Tanner Air Toxics Act (Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act (Chapter 1252, Statutes of 1987). Assembly Bill 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. The Air Toxics Hot Spots Information and Assessment Act requires that TAC emissions from stationary sources be quantified and compiled into an inventory according to criteria and guidelines developed by ARB, and if directed to do so by the local air district, a health risk assessment (HRA) must be prepared to determine the potential health impacts of such emissions.

In 1991, the ARB identified Perchloroethylene as a TAC under California's Toxic Air Contaminant Identification and Control Program (Health and Safety Code section 39650 et. seq.). The Board adopted the Airborne Toxic Control Measure for Emissions of Perchloroethylene from Dry Cleaning Operations (Dry Cleaning ATCM) and the Environmental Training Program for Perchloroethylene Dry Cleaning Operations in 1993. In 2007, the State of California adoption amendments to the Dry Cleaning ATCM which requires for Perchloroethylene manufacturers and distributors to phase out the use of Perchloroethylene dry cleaning machines and related equipment by January 1, 2023. New Perchloroethylene dry cleaning machines are prohibited from being installed anywhere in the state (since January 1, 2008).

LOCAL PLANS, POLICIES, REGULATIONS AND LAWS

Sacramento Metropolitan Air Pollution Control District

The SMAQMD is the agency responsible for the administration of federal and State air quality laws, regulations, and policies within Sacramento County. Included in the SMAQMD's tasks are monitoring of air pollution, preparation of the SIP for pollutants which do not meet ambient air quality standards, and promulgation of rules and regulations. The SIPs include strategies used to attain the federal ozone and federal $PM_{2.5}$ standards within the county. The rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

Specific rules that could be applicable to construction that could be proposed in the future within the SOIA Area may include, but are not limited to the following:

- Regulation 4 – Prohibitory Rules
  - Rule 402 Nuisance
  - Rule 403 Fugitive Dust
  - Rule 404 Particulate Matter
  - Rule 405 Dust and Condensed Fumes
  - Rule 412 Water Heaters, Boilers, and Process Heaters Rated less Than 1,000,000 BTU Per Hour
  - Rule442 Architectural Coatings
  - Rule 466 Solvent Cleaning
- Regulation 8 – New Source Performance Standards
  - Rule 801 New Source Performance Standards

The proposed project does not include and proposed land use change or development proposal, but if there are development proposals in the future, it is possible that these rules could apply.

The SMAQMD developed a $PM_{2.5}$ Implementation/Maintenance Plan and Re-Designation Request for the Sacramento $PM_{2.5}$ Nonattainment Area which was submitted to ARB at the end of 2013. The SMAQMD and other air districts in the nonattainment area are in the process of submitting a request to be re-designated attainment and provide the required maintenance demonstration submittal to ARB and US EPA. On May 28, 2015 the SMAQMD Board of Directors adopted the Triennial Report and Air Quality Plan Revision. This plan evaluates the progress made towards attaining the state air quality standards in Sacramento County, mitigate ozone transport, and pursue adoption of control measures.

Sacramento Area Council of Governments

The Sacramento Regional Council of Governments (SACOG) adopted the 2016 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS). The MTP/SCS supports emission reduction requirements in the SIPs that contribute to attainment of NAAQS within the region. The MTP/SCS was developed to meet regional air quality standards and future transportation and land use needs based on the projected future population in the area. The location and pattern of growth is important because it determines travel behavior and provides a means for determining the impact of future vehicle emissions within the region (SACOG 2016). The 2016 MTP/SCS demonstrates a land use and transportation strategy that would achieve a per-capita emission reduction target of 7.6% by 2020 and 15.58% by 2035 for greenhouse gas (GHG) emissions generated by light-duty cars and trucks in the region (SACOG 2016, Table 7.7, page 173). Reducing vehicle miles traveled with a compact growth pattern to foster alternative forms of transportation other than single-occupancy automotive travel is a key principle of the MTP/SCS and contributes to reducing criteria air pollutant emissions generated by mobile sources, particularly NO_X and particulate matter.

City of Elk Grove

The City of Elk Grove General Plan establishes goals, policies, and actions which were created to guide both future and present development within the City's jurisdiction. Policies and actions within the City of Elk Grove's General Plan, specifically the Conservation and Air Quality (CAQ) Element and Circulation (CI) Element, which relate directly or indirectly to air quality that may apply to potential future development in the SOIA Area, are listed below:

- **CAQ-26:** It is the policy of the City of Elk Grove to minimize air pollutant emissions for 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.

- **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 form 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 non-peak hours.

- **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.

- **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.

- **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 later phases of a multi-phased project which included emission reduction measures in its design) or which are required to mitigate other impacts.

- **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.

- **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.

- **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.

- **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.

- **CI-1:** Circulation planning for all modes of travel (vehicle, transit, bicycle, pedestrian, etc.) shall be coordinated with efforts to reduce air pollution.

- **CI-3:** The City's efforts to encourage alternative modes of transportation will therefore focus on incentives to reduce vehicles use, rather than disincentives (which are generally intended to make driving and parking less convenient, more costly, or both). Incentives may include:

    - Preferential carpool and vanpool parking,
    - Bus turnouts, and
    - Pedestrian-friendly project designs

- **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.

- **CI-5:** The City shall encourage the use of transportation alternatives that reduce the use of personal motor vehicles

- **CI-7:** the City shall encourage an approach to public transit service in Elk Grove which will provide the opportunity for workers living in other areas of Sacramento County to use all forms of public transit – including bus rapid transit and light rail – to travel to jobs in Elk Grove, as well as for Elk Grove workers to use public transit to commute to jobs outside the city.

- **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 Highway 99.

- **CI-9:** Light rail service in Elk Grove should be designed to serve major employment centers and the regional mall at Kammerer Road/Hwy 99. The City of Elk Grove encourages the development of light rail which will bring workers and shoppers to Elk Grove, while also serving as part of a coordinated, regional transportation network.

- **CI-17:** The City shall regulate truck travel as appropriate for the transport of goods, consistent with circulation, air quality, congestion management, and land use goals.

- **H-6:** Support energy-conserving programs in the production and rehabilitation of affordable housing to reduce household energy costs, improve air quality, and mitigate potential impacts of climate change in the region.

    - **H-6 Action 1:** Continue to promote and support energy efficiency in new construction by encouraging developers to utilize Sacramento Municipal Utility District (SMUD) energy programs and other energy efficiency programs and to be consistent with the Sustainability Element of the General Plan and the City's Climate Action Plan.

- **H-6 Action 2:** Continue to encourage participation in SMUD's PV (photovoltaic) Pioneer program by issuing PV system permits at no charge upon SMUD's approval.

City of Elk Grove Climate Action Plan

In 2013, the City of Elk Grove Climate Action Plan (CAP) was adopted by the City Council, along with the Sustainability Element of the City of Elk Grove General Plan. This planning document identifies sources of greenhouse gas (GHG) emissions within the City and identifies measures to reduce emissions related to energy use, transportation, land use, water use, and solid waste. The City's intent is for development projects consistent with the CAP and the General Plan to tier from the CAP's environmental review process and minimize subsequent project-level analysis. The CAP indicates that the reduction measures on a project-by-project basis should achieve a 15 percent reduction below 2005 GHG emission levels by 2020. Table 3.3-4 presents GHG reduction measures from the City of Elk Grove Climate Action Plan that could also help reduce air quality impacts. This is relevant because sources of GHG emissions are often also sources of criteria air pollutants.

Table 3.3-4. City of Elk Grove Climate Action Plan Applicable GHG Reduction Measures

Reduction Measures		Policy Topic
BE-6	Building Stock: New Construction. Adopt CALGreen Tier 1 standards to require all new construction to achieve a 15% improvement over minimum Title 24 CALGreen Energy requirements.	Built Environment
BE-7	Building Stock: Appliances and Equipment in New Development. Encourage the use of energy-efficient appliances and equipment in new buildings that maximize efficiency.	Built Environment
BE-8	Community Forestry. Plan trees in appropriate densities and locations that will maximize energy conservation and air quality benefits.	Built Environment
BE-9	Cool Paving Materials. Encourage the use of high-albedo material for future outdoor surfaces to the greatest extent feasible, including but not limited to parking lots, median barriers, roadway improvements, and sidewalks.	Built Environment
BE-10	On-Site Renewable Energy Installations. Promote voluntary installations of on-site solar photovoltaics in new and existing development, and revise standards to facilitate the transition to solar water heaters and solar photovoltaics in new development.	Built Environment
BE-11	Off-Site Renewable Energy. Encourage participation in SMUD's off-site renewable energy programs, which allow building renters and owners to choose locally produced cleaner electricity sources.	Built Environment
RC-1	Waste Reduction. The City shall facilitate recycling, reduction in the amount of waste, and reuse of materials to reduce the amount of solid waste sent to the landfill from Elk Grove and achieve an 80% diversion by 2020.	Resource Conservation
RC-2	Water Conservation. Reduce the amount of water used by residential and nonresidential uses.	Resource Conservation
RC-3	Recycled Water. Promote and remove barriers to the use of greywater systems and recycled water for irrigation purposes.	Resource Conservation
TACM-1	Local Goods. Promote policies, programs, and services that support the local movement of goods in order to reduce the need for travel.	Transportation Alternatives & Congestion Management
TACM-2	Transit-Oriented Development. Support higher-density, compact development along transit by placing high-density, mixed-use sites near transit opportunities.	Transportation Alternatives & Congestion Management
TACM-3	Intracity Transportation Demand Management. The City shall continue to implement strategies and policies that reduce the demand for personal motor vehicle travel for intracity (local) trips.	Transportation Alternatives & Congestion Management
TACM-4	Intracity Transportation Demand Management. The City shall support and contribute to regional efforts to reduce demand for intercity (regional) personal vehicle travel.	Transportation Alternatives & Congestion Management

Table 3.3-4. City of Elk Grove Climate Action Plan Applicable GHG Reduction Measures		
	Reduction Measures	Policy Topic
TACM-5	Pedestrian and Bicycle Travel. Provide for safe and convenient pedestrian and bicycle travel through implementation of the Bicycle and Pedestrian Master Plan and increased bicycle parking standards.	Transportation Alternatives & Congestion Management
TACM-6	Public Transit. Continue to improve and expand transit services for commuters and non-commuters traveling within Elk Grove and regionally, providing the opportunity for workers living in other areas of Sacramento County to use all forms of public transit - including bus rapid transit and light rail - to travel to jobs in Elk Grove, as well as for Elk Grove residents to use public transit to commute to jobs outside the City.	Transportation Alternatives & Congestion Management
TACM-7	Jobs/Housing Balance. Continue to improve Elk Grove's jobs/housing ratio and seek to achieve sufficient employment opportunities in Elk Grove for all persons living in the City.	Transportation Alternatives & Congestion Management
TACM-9	Efficient and Alternative Vehicles. Promote alternative fuels and efficient vehicles throughout the community.	Transportation Alternatives & Congestion Management
TACM-10	Car Sharing. Promote the use of vehicles and transportation options other than single-occupant vehicles.	Transportation Alternatives & Congestion Management
TACM-11	Safe Routes to School. Implement SACOG's Safe Routes to School Policy.	Transportation Alternatives & Congestion Management
TACM-12	Traffic Calming and Anti-Idling. Improve traffic flow and reduce unnecessary idling through use of traffic calming devices and enforcement of idling restrictions.	Transportation Alternatives & Congestion Management
MP-2	Municipal Facilities: New. All City facilities shall incorporate energy-conserving design and construction techniques.	Municipal Programs
MP-7	Municipal Water Use. Improve the efficiency of municipal water use through retrofits and employee education.	Municipal Programs
MP-8	Municipal Waste. Reduce municipal waste through employee education and environmentally preferable purchasing.	Municipal Programs

Sacramento LAFCo Policies, Standards, and Procedures

Sacramento LAFCo has developed standards and guidelines in its Plans, Policies, and Procedures Manual that aide in the implementation of the CKH Act and indirectly apply to air quality.

Chapter IV, General Standard

- **Section F.** Application of the California Environmental Quality Act to Changes of Organization or Reorganization and Spheres of Influence.

  Standard F.4. In preparing an Initial Study for the project subject to LAFCo review, the LAFCo will generally consider the project to have the potential to significantly affect the environment if one or more of the following situations exists:

  - Any of the circumstances referred to in Appendix G of the state CEQA guidelines exist.
  - If the project has substantial growth-inducing potential because it would result in:
    - extending a major roadway into an undeveloped area;
    - extending a sewer trunk line to a substantial area not currently served;
    - extending water service to a substantial area not currently served;

- providing electric service to a substantial area not currently served;
- providing or requiring flood control or other public facility which will protect the public safety so as to permit new development in an area substantially larger than the proposed project;
- providing any other public service or facility to a substantial area which could not grow without such service; and
- encouraging or fostering growth in a substantial area.

3.3.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

METHODOLOGY

Although there are no changes to land uses proposed as part of the proposed SOIA, in order to facilitate environmental analysis for this SOIA request, a conceptual land use scenario was developed. LAFCo has no land use authority, but if the SOIA is approved and annexation to the City of Elk Grove is subsequently proposed, land use planning and potential future development proposals could occur under the City's jurisdiction. Prezoning of the affected territory by the City would be required prior to any application for annexation.

This analysis discusses potential air pollutant emissions as a result of short-term construction and long-term operational activities due attributable to possible future development within the SOIA Area. Construction-related emissions would be generated throughout the buildout of the development area and would vary based on market conditions. Table 3.3-5 presents the inputs used to generate an analysis of the project's impacts was based on the total construction and operational emissions generated by this conceptual land use scenario.

Table 3.3-5. Conceptual Land Use Scenario for the Purposes of Analysis Only

Land Use	Jobs	Acreage	KSF*	Dwelling Units/Students
Multi-Family Residential (dwelling units)	-	87	-	1,786
Single-Family Residential (dwelling units)	-	430	-	3,214
Commercial (1,000 square feet)	1,613	48	1,362	-
Office (1,000 square feet)	14,784	325	6,091	-
Industrial (1,000 square feet)	3,452	125	2,338	-
School (students)	187	33	-	2,696
Parks/Open Space, Trails (acres)	-	108	-	-
Total Jobs	**20,036**			
Total Acreage	**1,156**			
Total Non-Residential Square Footage	**9,791,000**			
Total Dwelling Units	**5,000**			
Total Students	**2,696**			

*KSF = 1,000 square feet.

Source: Land use scenario developed by AECOM 2016.

For program-level analysis of area plans where it is not possible to know how much construction activity would occur in a given year, SMAQMD recommends a conservative assumption that 25 percent of the total land uses could be constructed in a single year (SMAQMD 2016). For the purposes of this analysis, and to ensure conservative results, 25 percent of the land uses that could be developed were assumed to be constructed in the earliest possible construction year (2017). This provides a very conservative estimate of the conceptual land use scenario's construction-related emissions since it is very likely not possible that 25 percent of future land use in the proposed SOIA Area could be under construction in 2017, and since existing regulations have the effect of reducing construction-related emission rates over time.

Construction emissions were modeled using the California Emissions Estimator Model (CalEEMod) Version 2013.2.2. CalEEMod includes default assumptions for construction parameters, such as construction equipment, haul trucks, and worker trips, which were used to model the proposed project's construction-related emissions in the absence of project-specific information. It should be noted that CalEEMod default assumptions are typically conservative to avoid underestimating emissions when project-specific information is unknown. Construction-related emissions are compared with the applicable SMAQMD thresholds of significance to determine significance.

Operational emission following construction of the conceptual land use scenario would be generated by area, energy, and mobile-sources. Area sources would include hearth and consumer products for residential uses and periodic architectural coatings and landscape equipment for residential and non-residential land uses. Energy sources would include natural gas combustion for space and water heating in residential and non-residential buildings. CalEEMod was used to model area and energy source operational emissions.

Mobile sources would involve vehicle trips associated with residential (e.g., work, shopping, and other trips) and non-residential (e.g., customers, employees, and material delivery trips) activities. The current version of CalEEMod uses emission factors from the previous EMFAC2011 model and has not been updated with the more recent EMFAC2014 model as of the writing of this section. The EMFAC2011 model does not consider recent rulemakings regarding emission benefits, including on-road diesel fleet rules, Advanced Clean Car Standards, and the Smartway/Phase 1 Heavy Duty Vehicle Gas Regulation. Thus, this analysis presents a conservative estimation of mobile emissions (that would tend to overestimate emissions) generated by the full-buildout of the conceptual land use scenario. Operational emissions are compared with SMAQMD thresholds of significance to determine significance. Refer to Appendix B of this EIR for a detailed summary of the CalEEMod modeling assumptions, inputs, and outputs.

THRESHOLDS OF SIGNIFICANCE

The general procedures to assess potential air quality impacts are described in the *CEQA Guide to Air Quality Assessment* published by the SMAQMD. This document references Appendix G of the CEQA Guidelines, which suggests that the proposed SOIA could have a significant impact on air quality, if it would result in any of the following situations:

- 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 non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.
- As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. Thus, according to SMAQMD, an air quality impact is considered significant if the proposed project would: generate average daily construction-related criteria air pollutant or precursor emissions that exceed the SMAQMD-recommended thresholds of 85 pounds per day (lbs/day) of NO_X, 80 lbs/day of PM_{10}, and 82 lbs/day of $PM_{2.5}$, or result in a violation of the CAAQS;
- Generate long-term regional criteria air pollutant or precursor emissions that exceed the SMAQMD-recommended thresholds of 65 lbs/day of NO_X, 65 lbs/day of ROG, PM_{10}, 80 lbs/day of PM_{10}, and 82 lbs/day of $PM_{2.5}$, or result in a violation of the CAAQS;
- Expose the maximally exposed individual (MEI) to TAC emissions that exceed an incremental increase in cancer risk of more than 10 in one million and/or a ground-level concentration of non-carcinogenic TAC emissions that would result in a Hazard Index equal to 1 or greater; or
- Create objectionable odors affecting a substantial number of people.

Since there is considerable overlap between the threshold questions, this section has been reorganized to improve clarity and readability into four impact statements addressing:

- Short-term, construction-related emissions
- Long-term, operational emissions
- Exposure of sensitive receptors to substantial pollutant concentrations; and
- Exposure to objectionable odors.

Two of the Appendix G checklist questions address conflicts with an air quality plan and contribution to an air quality violation. The criteria air pollutant significance thresholds serve as a proxy for these impacts, and therefore, conflicts with air quality plans and air quality violations are consolidated into the impact statements below.

For cumulative impacts, SMAQMD states that if a project would be significant on the project-level (i.e., exceed any of the thresholds listed above), it could also be considered significant on a cumulative level (SMAQMD 2016). Please see Chapter 5 of this EIR, which addresses cumulative impacts in detail.

IMPACT ANALYSIS

IMPACT 3.3-1 **Short-term construction emissions of criteria air pollutants and precursors.** *Emissions of criteria air pollutants and precursors resulting from construction activities accommodated under the conceptual land use scenario could violate an ambient air quality standard or contribute substantially to an existing or predicted air quality violation by exceeding the SMAQMD daily construction thresholds. The impact is considered* ***significant****.*

The proposed SOIA does not include changes to land use, land use designations, or zoning. In addition, no specific land use entitlements, development proposals, or land development activities are proposed at this time in conjunction with the proposed SOIA. However, land use assumptions were developed for this analysis to allow LAFCo and the public to understand possible environmental effects that could result from future development within the SOIA Area.

Construction emissions are described as "short-term" or temporary in duration but have the potential to adversely affect air quality. Construction-related activities such as site preparation (e.g., excavation, grading, and clearing), use of off-road equipment, material delivery, and exhaust emissions from construction worker commutes would result in temporary emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Emissions of ROG and NO_X are associated primarily with exhaust from construction equipment. Given that exhaust emission rates of the construction equipment fleet in the state are expected to decrease over time as stricter standards take effect and older equipment is retired, construction emissions were estimated using the earliest calendar year when construction could begin (2017) to generate conservative estimates. In later years, advancements in engine technology, retrofits, and turnover in the equipment fleet will result in lower levels of emissions.

Fugitive dust emissions are associated primarily with site preparation and vary as a function of soil silt content, soil moisture, wind speed, acreage of disturbance, the amount of travel to and from a construction site, and other factors. During typical construction projects, the majority of PM emissions are generated in the form of fugitive dust during ground disturbance activities. Most fugitive dust is generated during the grading phase. PM emissions are also generated by equipment exhaust and re-entrained road dust from vehicle travel on paved and unpaved surfaces.

Table 3.3-6 summarizes the modeled emissions of ROG, NO_X, $PM_{10,}$ and $PM_{2.5}$ associated with construction under the conceptual land use scenario. As shown in Table 3.3-6 daily NO_X, PM_{10}, and $PM_{2.5}$ emissions associated with construction of the conceptual land use scenario would exceed SMAQMD thresholds of significance for NO_X. Thus, construction of the conceptual land use scenario could violate or contribute substantially to an existing or projected air quality violation. Future development activities within the SOIA Area could accommodate more population and jobs than anticipated by the SMAQMD air quality attainment plans and the Sacramento Area Council of Governments (SACOG) 2016 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) growth assumptions, and, therefore, would be inconsistent with both applicable SMAQMD air quality attainment plans. Development of the SOIA Area could conflict with attainment planning efforts if SMAQMD thresholds are exceeded. Since the timing and level of construction activities each year is unknown, it is not possible to estimate the extent to which the reduction strategies would result in emission

reductions. Therefore, construction-related air quality impacts generated by implementation of the proposed project are considered **potentially significant**.

Table 3.3-6. Maximum Annual Criteria Air Pollutant and Precursor Construction Emissions

Source	Emissions (lbs/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Year 2017 [2]	326	279	60	31
SMAQMD Threshold of Significance	-	85	80	82
Exceeds Threshold?	-	Yes	No	No

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

[1] SMAQMD's threshold of significance is in units of pounds per day.

[2] Construction emissions assume that 25% of all land uses are developed in the earliest possible construction year (2017).

Source: AECOM 2016; See Appendix B for detailed construction assumptions and modeling outputs.

Mitigation Measure 3.3-1: Apply SMAQMD Basic Construction Emission Control Practices

At the time of submittal of any application to annex territory within the SOIA Area, the City of Elk Grove shall require that all discretionary projects comply with Basic Construction Emission Control Practices identified by the SMAQMD and listed below or Basic Construction Emission Control Practices as they may be updated in the future:

- 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 track out mud or dirt onto adjacent public roads at least once a day. Use of dry powered 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 [required by California Code of Regulations, Title 13, sections 2449(d) and 2485]. 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.

Significance after Mitigation

Future urbanization of the SOIA Area could generate construction emissions above the thresholds of significance adopted by the SMAQMD. Development within the SOIA Area will be required to demonstrate consistency with CAQ-32 and CAQ-33 policies in the City of Elk Grove's General Plan, which require assessment and mitigation of air pollutant emissions impacts, including the use of low-emission vehicles and equipment during construction, where feasible. If the City implements these policies in the future within the SOIA Area, this could help to reduce emissions. In addition, Mitigation Measure 3.3-1 would further reduce the impact. However, it cannot be demonstrated at this time that this would reduce impacts to a less-than-significant level for each possible individual project or combination of projects developed simultaneously under the conceptual land use scenario. It is possible that construction-related emissions of criteria air pollutants and precursors could still exceed significance thresholds. Such emissions could violate or contribute substantially to an existing or projected air quality violation and/or expose sensitive receptors to substantial pollutant concentrations. There is no additional feasible mitigation available. This impact is s**ignificant and unavoidable**.

IMPACT 3.3-2 Long-term operational emissions of criteria air pollutants and precursors. *Development within the SOIA Area would generate long-term operational emissions that would exceed applicable SMAQMD thresholds. The impact is considered* ***significant****.*

As previously stated, the proposed SOIA does not include development or land use change. However, land use assumptions were developed for this analysis in order to illustrate the types of environmental effects that could result from possible future development in the SOIA Area.

Buildout of the conceptual land use scenario in the SOIA Area includes development of buildings, structures, paved areas, roadways, utilities, and other improvements. Daily activities associated with the operation of future uses within the SOIA Area would generate criteria air pollutant and precursor emissions from mobile, energy, and area sources. Mobile sources include vehicle trips associated with residents, employees, and visitors leaving and coming to the SOIA Area. Area sources include, but are not limited to, natural gas combustion for water and space heating, landscape maintenance equipment, hearth operation in residential homes, and periodic architectural coatings. While construction emissions are considered short-term and temporary, operational emissions are considered long-term and occur for the lifetime of the project. Therefore, operational emissions have greater potential to affect the attainment status of an air basin, particularly as a result of increased traffic from additional development.

As described above in the Methodology section, long-term operational emissions of the conceptual land use scenario were modeled using CalEEMod Version 2013.2.2. Table 3.3-7 presents the long-term operational emissions under this potential development, which was assumed to complete final buildout in the year 2035 – this is the last year available for modeling with CalEEMod. As summarized in Table 3.3-7, the long-term operational emissions attributable to the proposed project's conceptual land use scenario assumptions would generate emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ that exceed the applicable SMAQMD thresholds of significance for each criteria pollutant for which SMAQMD has a threshold. Future development activities within the SOIA Area could accommodate more population and jobs than anticipated by the SMAQMD air quality attainment plans and the Sacramento Area Council of Governments (SACOG) 2016 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) growth assumptions, and, therefore, would be inconsistent with both applicable SMAQMD air quality attainment plans. Development of the SOIA Area could conflict with attainment

planning efforts if SMAQMD thresholds are exceeded. Because long-term operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ would exceed SMAQMD thresholds of significance, potential future development within the proposed SOIA could violate or contribute substantially to an existing or projected air quality violation. The impact is considered **significant**.

Table 3.3-7. Maximum Annual Criteria Air Pollutant and Precursor Long-Term Operational Emissions

Emissions Source	Daily Emissions (lbs/day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area	571	5	3	3
Energy	9	81	6	6
Mobile	349	590	865	240
Total Operational Emissions [1]	930	676	874	249
SMAQMD Thresholds of Significance	65	65	80	82
Exceeds Thresholds?	Yes	Yes	Yes	Yes

Notes: lbs/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

[1] Operational emissions were modeled for year 2035.

Source: AECOM 2016; See Appendix B for detailed modeling assumptions, outputs, and results.

Mitigation Measure 3.3-2a: Prepare an Air Quality Plan to Reduce Potential Operational Emissions

At the time of submittal of any application to annex territory within the SOIA Area, the City of Elk Grove shall require all discretionary projects to prepare an Air Quality Management Plan that includes strategies to reduce or offset operational reactive organic gas (ROG) emissions by at least 35 percent compared to each project without the application of air pollutant emission reduction strategies.

The Air Quality Management Plan can include policies and emissions reduction measures demonstrating compliance with the City of Elk Grove's General Plan Conservation and Air Quality Element, in addition to reduction measures identified by the SMAQMD.

Mitigation Measure 3.3-2b: Prepare and Implement Bicycle, Pedestrian, and Transit Master Plan

At the time of submittal of any application to annex territory within the SOIA Area, the City of Elk Grove shall require that all discretionary projects prepare a bicycle, pedestrian, and transit master plan consistent with policies CAQ-29, CI-1, CI-3, CI-4, CI-5, and CI-7 and actions CAQ-29-Action 1 and CAQ-29-Action 2 of the City's General Plan and Elk Grove Climate Action Plan reduction measures TACM-4, TACM-5, TACM-6, and TACM-11.

This plan will identify primary pedestrian and bicycle connections to nearby destinations and to planned public transit stops delineating facilities in the SOIA Area, consistent with the goals and policies of the City's General Plan. The update will identify on- and off-street bikeways and pedestrian routes, as well as support facilities. This plan will also identify the roadways to be used by bus transit routes, future stops

and service locations, including locations for bus turnouts and pedestrian shelters, locations for bus transfer stations, alignment for fixed-route rail service, and the location of rail service stations.

Project applicants in the SOIA Area and the City of Elk Grove shall be responsible for implementing the master plan recommendation as development occurs in the SOIA Area.

Significance after Mitigation

Mitigation Measures 3.3-2a and 3.3-2b would assist in reducing operational air quality impacts and is similar to the City's Policy CAQ-30, which requires an emissions reduction of 15 percent or greater for new development projects (although the policy does not specify the pollutants that should be the focus of this emission reduction requirement). In the past, for projects that are not a part of a city or county's general plan, SMAQMD has recommended a target of a 35 percent reduction in ozone precursor emissions when a significance threshold would be exceeded. Although no specific development proposals or land use changes are proposed as part of this project, the SOIA would allow future annexation requests and if those annexation requests are approved, it is possible that there could be development of the SOIA Area that could result in a substantial increase in nonattainment pollutants, as shown in Table 3.3-7. LAFCo cannot demonstrate at this time that future development within the SOIA Area would be able to achieve this level of reduction, and even this level of reduction were achieved, it is possible that development of the SOIA Area could involve operational air pollutant emissions that still exceed SMAQMD thresholds. There is no additional feasible mitigation available that would avoid this impact. The impact is **significant and unavoidable**.

IMPACT 3.3-3 Exposure of sensitive receptors to substantial pollutant concentrations**.** *Local mobile-source emissions of CO would not be expected to substantially contribute to emissions concentrations that would exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm. However, if the SOIA Area is developed, during construction and operation, there would be an increase in the potential for exposure of sensitive land uses to substantial concentrations of TACs. This impact is considered significant.*

CO Hotspots

As noted previously, one mobile-source pollutant of localized concern is CO. Local mobile-source emissions of CO near roadway intersections are a direct function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. Under specific meteorological conditions, CO concentrations near roadways and/or intersections may reach unhealthy levels for local sensitive land uses such as residential units, hospitals, schools, and childcare facilities.

SMAQMD recommends a two-tiered screening approach to estimate whether a project's traffic impact would cause a potential CO hotspot at any given intersection. The first tier states, that if either of the following criteria is met, then the project could have the potential to create a violation of the CO standard.

- A traffic study for the project indicates that the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to an unacceptable LOS (typically LOS E or F); or

- A traffic study indicates that the project will substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity. "Substantially worsen" includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

SMAQMD provides a second tier screening method to determine if a project would have the potential to create a violation of the CO standard. If all of the following criteria are met, the project would result in a less-than-significant impact on 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, below-grade roadway, or other locations where horizontal or vertical mixing of air would be substantially limited.
- The mix of vehicle types at the intersection is not anticipated to be substantially different from the County average.

It is possible that multiple roadways could deteriorate in LOS to unacceptable levels should the conceptual land use scenario be built. However, due to the conceptual nature of the land use scenario, specific intersections cannot be analyzed at this time for CO impacts and forecasting level of detail required for a CO hotspot analysis is not feasible at the time of this EIR. In order to be conservative, this EIR assumes that the first tier of SMAQMD guidance has been fulfilled, and the second tier is evaluated.

The maximum daily volumes on the roadways analyzed in Section 3.14, "Transportation" would not exceed 31,600 vehicles, the screening level developed by SMAQMD. Daily volumes for cumulative conditions (higher traffic volumes than existing conditions) with development of a much larger previous SOIA request for 7,869 acres of land that included this SOIA Area were estimated to be a maximum of 99,100 for State Route (SR) 99 and 123,300 for Interstate 5 (I-5) (Fehr & Peers 2011). The K factor for 99 in Sacramento County ranges from 7 percent to 10.5 percent and the K factor for I-5 in Sacramento County ranges from 7.54 to 9.82 percent (Caltrans 2015). The K factor is the percentage of daily traffic that occurs in the peak period. Using all worst-case assumptions (highest K factor and highest segment volume), SR 99 and I-5 would have peak-hour volumes of approximately 10,400 for SR 99 and 12,100 for I-5, which does not approach the SMAQMD screening level. Implementation of the SOIA is not anticipated to contribute traffic to a location where horizontal or vertical mixing of air would be substantially limited, and the mix of vehicle types at these intersections is not anticipated to have a greater percentage of heavy-duty vehicles and would not be substantially different from the County average. Therefore, emissions of CO from local mobile sources and generated by the proposed SOIA would not result in or substantially contribute to emissions concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm, respectively. This impact is considered **less than significant**.

Construction-Related TACs

Construction of new buildings, structures, paved areas, roadways, utilities, and other improvements typically requires use of heavy-duty construction equipment, haul trucks, on-site generators, and construction worker vehicles which could generate diesel PM, which the ARB has identified as a TAC. Generation of diesel PM from construction projects typically occurs in a single area (e.g., at the project site) for a short period of time, but could also include linear infrastructure projects to support new land uses. Because construction activities and subsequent

emissions vary depending on the phase of construction (e.g., grading, building construction), the construction-related emissions to which nearby receptors are exposed to would also vary throughout the construction period.

During some equipment-intensive phases, such as grading, construction-related emissions would be higher than other less equipment-intensive phases, such as building construction or architectural coatings. Since the amount, type, and phasing of any development that could occur in the future in the SOIA Area is unknown, and since any future construction phases are also unknown, it is not possible to know whether there could be exposure to substantial pollutant concentrations during construction. It may be possible construction emissions to generate substantial pollutant concentrations if part of the SOIA Area contains established development while another part is under construction. It may be possible for off-site construction emissions to generate substantial pollutant emissions. Even in intensive phases of construction, there would not be substantial pollutant concentrations, with the potential exception of the immediate vicinity of the construction site. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (ARB 2005).

Emissions from construction equipment would be reduced over the entirety of the construction period due to phased standards for diesel equipment engines. In January 2001, EPA promulgated a final rule to reduce emissions standards for heavy-duty diesel engines in 2007 and subsequent model years. These emissions standards represent a 90 percent reduction in NO_X emissions, 72 percent reduction of nonmethane hydrocarbon emissions, and 90 percent reduction of PM emissions, in comparison to the emissions standards for the 2004 model year. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. Tier 4 emission standards requires engine manufacturers to meet after-treatment-based exhaust standards for NO_X and PM starting in 2011 that are more than 90 percent lower than current levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines.

The dose to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance in the environment and the extent of exposure a person has with the substance; a longer exposure period to a fixed amount of emissions would result in higher health risks for the Maximally Exposed Individual (MEI). According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments (HRAs) used to determine the exposure of sensitive receptors to TAC emissions should be based on a 30-year exposure period. However, such assessments should also be limited to the period/duration associated with construction activities. OEHHA recommends that construction activities for individual projects that are longer than 2 months be evaluated for potential cancer risks.

Construction activities associated with conceptual development of the SOIA Area would have intermittent and temporary construction emissions, and it is possible that construction projects would occur in areas adjacent to sensitive receptors. It is possible that multiple elements of construction within the proposed SOIA Area and possible off-site improvements could be proposed to occur simultaneously in areas near existing or future planned sensitive receptors. Prior to any construction, any proposed development would want to compare the project to the screening levels outlined in the *CEQA Guide to Air Quality Assessment*. Schedule and phasing is unknown at the time of this writing. Therefore, given the possibility that construction activities could occur within a distance and for a duration that would generate substantial TAC exposure to sensitive receptors, this impact is considered **potentially significant**.

Operational TACs

If the SOIA Area is developed in the future, this could involve the establishment residential, commercial, civic, parks and recreation, industrial, and other uses. Residential land uses do not typically generate substantial TAC emissions. Commercial land uses could include stationary sources of TACs, such as diesel-fueled back-up generators. These types of stationary sources, in addition to any other stationary sources (including industrial land uses) that may emit TACs would be subject to SMAQMD Rules and Regulations. Land uses that are more likely to generate substantial TAC emissions include industrial land uses that involve stationary sources, manufacturing processes, and large-scale commercial, warehousing, logistics, or other uses that would attract substantial heavy truck traffic.

ARB has developed the *Air Quality and Land Use Handbook: A Community Health Perspective* to provide guidance on land use compatibility with sources of TACs (ARB 2005). These sources include freeways and high-traffic roads, commercial distribution centers, rail yards, refineries, dry cleaners, gasoline stations, and industrial facilities. The handbook is not a law or adopted policy, but offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs. The handbook indicates that land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The recommendations include:

- Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day.
- 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).
- Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation.
- 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.

Heavy-Duty Trucks

Mobile sources of TACs would be associated primarily with the operation of on-road heavy-duty diesel trucks used if, in the future, there are any on-site commercial/industrial activities (e.g., unloading/loading). According to the ARB guidance document *Air Quality and Land Use Handbook: A Community Health Perspective,* ARB recommends avoiding the siting of new commercial trucking facilities that accommodate more than 100 trucks per day, or 40 trucks equipped with transportation refrigeration units (TRUs), within 1,000 feet of sensitive receptors (e.g., residences) (ARB 2005). ARB has 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 five minutes, under most circumstances. In addition, projects that use TRUs as part of their operations or facilities that meet the required number of loading docks would be

required to comply with the ARB's Transport Refrigeration Unit ATCM, which sets in-use emission performance standards for TRUs to limit diesel PM emissions.

The project does not propose development or any land use change. If the SOIA is approved, and if there are annexation requests in the future that are approved, and if there is development proposed in the future, it is possible that such development could involve uses that attract a large amount of heavy-duty truck traffic. The impact is considered **potentially significant**.

Exposure to High-Volume Roadways

SMAQMD has developed the *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadway's* guidance, consistent with the ARB recommendations, and with detailed guidance for the Sacramento region (SMAQMD 2009). The protocol includes a three-step screening process. SMAQMD uses screening criteria adopted from the *Air Quality and Land Use Handbook: A Community Health Perspective* where project screening is determined 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 per day, or rural roadway with 50,000 vehicles per day). If the project is outside of the 500-foot distance from a high-traffic volume roadway, the proposed project meets the ARB guidance distance and no further roadway-related air quality evaluations are recommended. If the project is within 500 feet, step 2 of the project screening process which uses tables based on peak hourly volumes that can be used to evaluate the cancer risk associated with major roadways. The protocol states that if the nearest sensitive receptor's increase in individual cancer risk is lower than the evaluation criterion of 296 cases per million, no further roadway-related air quality evaluation is recommended.

Daily volumes for existing conditions plus the development of a previous and larger SOIA request for 7,869 acres of land that included the current proposed SOIA Area were estimated to be a maximum of 69,500 for SR 99, 17,100 for Kammerer Road, 29,300 for Eschinger Road, and 27,500 for Bruceville Road (Fehr & Peers 2011). None of the daily volumes for conditions with development of a much larger previous SOIA request for 7,869 acres of land that included this SOIA Area exceed the screening level included in the first step of SMAQMD's screening process. Thus, the proposed SOIA does not have any roadways in the vicinity that would exceed the project screening levels established by SMAQMD. This impact is considered **less than significant**.[1]

Traffic Generation along High-Volume Roadways

It is possible that, if the SOIA is approved, and if there is future annexation, if that annexation is approved, and if there is future development within the SOIA Area, that such development could generate or attract trips that could use I-5. According to the EIR for the previous and larger SOIA request, volumes along I-5 north of Laguna Boulevard could approach 103,400 with existing conditions plus the development of the previous SOIA request of 7,869 acres. The K factor for I-5 in Sacramento County ranges from 7.54 to 9.82 percent. Based on these worst-

[1] LAFCo notes that the purpose of this EIR is to identify the significant effects of the proposed SOIA on the environment, not the significant effects of the environment on the proposed project. This is consistent with a recent California Supreme Court's decision (California Building Industry Association v. Bay Area Air Quality Management District [2015] 62 Cal.4th 369, Case No. S213478). Although identifying the environmental effects of attracting development and people to an area is consistent with CEQA's legislative purpose and statutory requirements, identifying the effects on the proposed project and its users of locating the project in a particular environmental setting is neither consistent with CEQA's legislative purpose nor required by the CEQA statutes. Nonetheless, for disclosure purposes, LAFCo has elected to provide analysis of relevant impacts of existing environmental conditions relative to the proposed SOIA, including exposure to existing TAC emissions.

case assumptions, I-5 could have peak-hour volumes of approximately 10,154, if the previous 7,869-acre area were developed (Caltrans 2015). Using SMAQMD's Major Roadway Protocol lookup table, incremental cancer risk for this peak hourly volume would exceed 296 somewhere between 25 and 200 feet from the edge of the outside travel lanes to the east and between 10 and 50 feet to the west (SMAQMD 2009, Table 2, page 11). If there is future development within the SOIA Area, it is possible that such development would contribute trips to I-5, which could contribute substantial pollutant concentrations along the I-5 corridor. The impact is **potentially significant**.

Operational activities that require the use of diesel-fueled vehicles for extended periods, such as commercial trucking facilities or delivery/distribution areas, may generate diesel PM emissions that could expose sensitive receptors to diesel PM emissions. Although commercial and industrial uses that would be developed SOIA Area have not been specifically identified, it is possible that uses developed in the SOIA Area could have tenants that would require large delivery and shipping trucks that use diesel fuel. The diesel exhaust PM emissions generated by these uses would be produced primarily at single locations on a regular basis (e.g., loading dock areas). Idling trucks, including TRUs, increase diesel PM levels at these locations. Occupants of nearby existing and proposed residences could be exposed to diesel exhaust PM emissions on a reoccurring basis. Therefore, given the possibility that operational activities could occur within a distance and for a duration that would generate substantial TAC exposure to sensitive receptors, this impact is considered **potentially significant**.

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 sensitive receptors.

Mitigation Measure 3.3-3: Assess and Reduce Potential Construction-Related and Operational TAC-Related Effects

At the time of submittal of any application to annex territory within the SOIA Area, the City of Elk Grove shall require all discretionary projects (both concurrent and subsequent projects) with the potential to generate substantial TAC emissions require a project-level analysis with appropriate mitigation, as necessary, to ensure that sensitive receptors are not exposed to substantial pollutant concentrations. In communication with the SMAQMD, the City will require, if necessary, a site-specific analysis for construction and operational activities to determine whether health risks attributable to future proposed projects in relation to proposed, planned, and/or existing sensitive receptors would exceed applicable health risk thresholds of significance. Site-specific analysis may include screen level analysis, dispersion modeling, and/or a health risk assessment, consistent with applicable guidance from the SMAQMD. Analyses shall take into account regulatory requirements for proposed uses.

The City shall require the project applicant(s) to identify and implement feasible mitigation measures to reduce any potentially significant effect and communicate with the SMAQMD to identify measures to reduce exposure of sensitive receptors to substantial pollutant concentrations to levels consistent with thresholds recommended by the SMAQMD applicable at the time the project is proposed. If the SMAQMD does not have applicable thresholds at the time of this analysis, the thresholds will be an increased cancer risk of 10.0 in a million or more attributable to the project, and an increased non-cancer risk of 1.0 Hazard Index (chronic or acute) or more attributable to the project. If the project would exceed applicable thresholds recommended by the SMAQMD under existing plus project or cumulative conditions, mitigation will be required to reduce the impact to a less-than-significant level.

Construction

If analysis demonstrates that construction activities associated with development of on-site land uses or off-site improvement components within the proposed SOIA Area would exceed the performance standards identified in this mitigation measure, actions shall be taken to reduce potential construction-related impacts including, but not necessarily limited to:

- installing diesel particulate filters or implementing other ARB-verified diesel emission control strategies on all construction equipment to further reduce diesel PM emissions beyond the 45% reduction required by the District's Enhanced Exhaust Control Practices;
- use of equipment that meets Tier 4 emission standards (or newer phase equipment standards in place at the time of future development);
- using equipment during time when receptors are not present (e.g., when school is not in session or during non-school hours, or when office buildings are unoccupied);
- establishing staging areas for the construction equipment that are as far as possible from sensitive receptors;
- establishing an electrical supply to the construction site and use electric-powered equipment instead of diesel-powered equipment or generators, where feasible;
- using haul trucks with on-road engines instead of off-road engines even for on-site hauling;
- equipping nearby buildings with High Efficiency Particle Arresting (HEPA) filters systems at all mechanical air intake points to the building to reduce the levels of diesel PM that enter buildings;
- equip nearby buildings with appropriate filtration systems at all mechanical air intake points to the building to reduce the levels of diesel PM that enter the buildings;
- planning construction phasing to be linear so that future construction activities continue to move further away from occupied land uses; and/or
- planning construction phasing to complete mass site grading, which generates the largest portion of diesel PM emissions, prior to occupancy of the project site.

Operational

If the results of analysis for the operational activities of any component within the proposed SOIA Area determine that the performance standard for this mitigation would be exceeded, actions shall be taken to reduce potential operational impacts including, but not necessarily limited to:

- locating air intakes and designing windows to reduce particulate matter exposure by, for example, not allowing windows facing the source to open;

- posting signs 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 five (5) minutes on the premises in order to reduce idling emissions (consistent with the ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling);

- providing electrification hook-ups for TRUs to avoid diesel-fueled TRUs continuing to operate at loading docks during loading and unloading operations;

- requiring the TAC-generating activity (e.g., loading docks) be located away from sensitive receptors;

- incorporating exhaust emission controls on mobile and/or stationary sources (e.g., filters, oxidizers);

- evaluate the potential to consolidate delivery or haul truck trips to increase the load and decrease vehicle trips;

- provide building air filtration units with a Minimum Efficiency Reporting Value (MERV) that is adequate to address adjacent sensitive land uses according to performance standards of this mitigation measure. For example, MERV 16 filters have been found to remove up to 90 percent of $PM_{2.5}$, when used in combination with heating ventilation and air conditioning (HVAC) units;

- ensure adequate distance between existing and planned sensitive receptors and gasoline dispensing facilities, based on the proposed size and design of any gasoline-dispensing facilities, consistent with guidance from ARB and in consultation with SMAQMD.

Significance after Mitigation

If development occurs in the proposed SOIA under the City of Elk Grove's jurisdiction that requires discretionary action, the City will be required to make General Plan consistency findings, including consistency with Policy CAQ-33, which requires use of low emission vehicles and equipment, and Policy SA-10, which requires buffering from sources of TACs to protect public safety. In addition, implementation of Mitigation Measure 3.3-3 will require future development to that could generate TAC emissions will evaluate and mitigate TAC emissions to ensure sensitive receptors are not exposed to substantial pollutant concentrations. This evaluation and mitigation design is only possible once project-specific details for the TAC-generating use and the sensitive receptors are known. If future projects are conditioned to demonstrate consistency with the actions outlined above, which are demonstrated to substantially reduce exposure to TAC emissions, consistent with the performance standards identified above, this would significantly reduce any risk associated with possible future development within the proposed SOIA Area and possible off-site improvements necessary to serve possible future development within the proposed SOIA Area. However, it is not possible at this time to determine whether the above mitigation would avoid a significant effect in every instance. There is no additional feasible mitigation available that would avoid this impact. The impact is **significant and unavoidable**.

IMPACT 3.3-4 Exposure of sensitive receptors to emissions of odors**.** *Development within the SOIA Area could expose a substantial number of people to objectionable odors. The impact is considered* ***significant****.*

The human response to odors is subjective and sensitivity to odors varies greatly among the public. 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. SMAQMD has developed a list of facilities that are known producers of odors where more analysis may be warranted or where greater distance should separate a project from the odor source. Those facilities include, but are not limited to, wastewater treatment facilities, chemical manufacturing, sanitary landfill, transfer station, painting/coating operations (e.g., auto body shops), and food processing facility.

The following land use types are widely considered major sources of odors: wastewater treatment and pumping facilities, chemical manufacturing facilities, sanitary landfills, fiberglass manufacturing facilities, transfer stations, painting/coating operations (e.g., auto body shops), composting facilities, food processing facilities, confined animal facilities, asphalt batch plants, rendering plants, metal smelting plants, and coffee roasters. This list is meant not to be entirely inclusive, but to act as general guidance.

Minor sources of odors would be associated with the construction of the conceptual land uses. The predominant source of power for construction equipment is diesel engines. Exhaust odors from diesel engines, as well as VOC emissions associated with asphalt paving and the application of architectural coatings may be considered offensive to some individuals. Potential sources that may emit odors during construction activities include equipment and vehicle diesel exhaust. Odors from these sources would be localized and generally confined to the immediate area surrounding the development area. Exhaust odors from diesel engines, as well as VOC emissions associated with asphalt paving and the application of architectural coatings may be considered offensive to some individuals. Similarly, diesel-fueled trucks traveling on local roadways would produce associated diesel exhaust emissions. However, odors associated with diesel fumes, asphalt paving, and architectural coatings would be temporary and would disperse rapidly with distance from the source. Therefore, construction-generated odors would not result in frequent exposure of sensitive receptors to objectionable odor emissions. As a result, this impact would be **less than significant**.

Similarly, diesel-fueled vehicles would produce associated diesel exhaust fumes. However, because odors associated with diesel fumes would be temporary and would disperse rapidly with distance from the source, diesel-fueled vehicles would not result in the frequent exposure of receptors to objectionable odor emissions.

According to SMAQMD, for a project located near an existing source of odors, the impact is potentially significant when the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source. For projects locating near a source of odors where there is currently no nearby development and for odor sources locating near existing receptors, the determination of significance should be based on whether odor complaints from the public have occurred in the vicinity of a similar facility at a similar distance.

SMAQMD regulates nuisance odors through Rule 402, although certain odors are exempted, such as odors from agricultural activities and composting facilities. Any actions related to odors are based on citizen complaints to local governments and the SMAQMD.

The proposed SOIA Area is within unincorporated Sacramento County and is primarily used for extensive dry farmed and irrigated croplands and vineyard operations. The site also includes the McConnell Estates winery and tasting room, which hosts weddings, concerts, and other events throughout the year. Agricultural uses, such as those that existing within and surrounding the SOIA Area could create objectionable odors that could affect

potential new odor-sensitive uses that could be developed within the SOIA Area while agricultural uses are ongoing – within or adjacent to the proposed SOIA Area.

The conceptual land use scenario applies a range of land use designations including retail, office, commercial and industrial uses. All new development projects will be required to meet existing regulations, including permitting requirements and disclosure laws. Compliance with permitting requirements, air district rules and regulations, and state requirements would reduce potential odor-related impacts. However, it is unknown if existing uses would continue to operate in the future or if additional source s of odor would be proposed as part of the potential urbanization within the SOIA Area. Existing and future sources of odors must comply with Rule 402, which regulates nuisance exposure, including nuisances due to odorous emissions. However, because the project may indirectly result in the future urbanization of the SOIA Area, the project may indirectly result in receptors being located within close proximity of odor sources. The impact is considered **significant**.

Mitigation Measure 3.3-4: Assess and Reduce Odor Exposure Effects

At the time of submittal of any application to annex territory within the SOIA Area, the City of Elk Grove shall require all discretionary projects review existing sources of odor in and around the project site, including (but not limited to) any land use referenced in SMAQMD's *CEQA Guide to Air Quality Assessment* document as an odor-generating land use. Discretionary projects will be required to address odor impacts that will protect sensitive land uses in consultation with SMAQMD. Methods to address odor impacts may include buffers and emission source controls.

Significance after Mitigation

Implementation of Mitigation Measure 3.3-4 will require future development to address any odor impacts according to SMAQMD guidance. This mitigation measure ensures sensitive receptors are protected from odor sources. If future projects are conditioned to demonstrate consistency with the actions outlined above, this would substantially reduce the impact. However, it is possible that, if there is future development in the SOIA Area, that future odor sources could affect on-site uses, and that it may not be feasible to completely avoid exposure to odors. There is no additional feasible mitigation available that would avoid this impact. The impact is **significant and unavoidable**.