4.7 AIR QUALITY

This section evaluates short-term (construction) and long-term (operational) impacts to air quality that would potentially occur as a result of the proposed Mitchell Farms Subdivision (project). The project would generate air pollutant emissions during construction activities, including for the associated infrastructure and roads, and occupancy of the project. No comments were received addressing air quality concerns in response to the project's Notice of Preparation. The Notice of Preparation and comments received are included in Appendix A.

The background information and impact analysis presented in this section is based on project plans, use of the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 to estimate project emissions, with modeling outputs provided in Appendix E, the City of Citrus Heights General Plan Update and Greenhouse Gas Reduction Plan Environmental Impact Report (EIR) (City of Citrus Heights 2011a), and the Sacramento Metropolitan Air Quality Management District's (SMAQMD) Guide to Air Quality Assessment in Sacramento County (SMAQMD 2016).

4.7.1 Environmental Setting

Ambient air quality is generally affected by climatological conditions; the topography of the air basin; the type and amounts of pollutants emitted; and, for some pollutants, sunlight. The project site is located within the Sacramento Valley Air Basin (SVAB). Topographical and climatic factors in the SVAB create the potential for high concentrations of regional and local air pollutants. This section describes relevant characteristics of the air basin, types of air pollutants, health effects, and existing air quality levels.

The SVAB includes Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, Yolo, and portions of Solano and Placer Counties. The SVAB extends from south of Sacramento to north of Redding and is bounded on the west by the Coast Ranges and on the north and east by the Cascade Range and Sierra Nevada. The San Joaquin Valley Air Basin is located to the south.

Climate and Topography

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the valley. Temperature may range from 20°F to 115°F, with summer highs usually in the 90s and winter lows occasionally below freezing. The high average summer temperatures, combined with very low relative humidity, produces hot, dry summers that contribute to ozone buildup. Average annual rainfall is approximately 20 inches, with snowfall being very rare. The prevailing winds are moderate in strength and vary from moist, clean breezes from the south to dry land flows from the north (SMAQMD 2016).

Weather patterns throughout the SVAB are affected by geography. Mountain ranges tend to buffer the basin from the marine weather systems that originate over the Pacific Ocean. However, the Carquinez Strait creates a breach in the Coast Range on the west of this basin, which exposes the midsection of the SVAB to marine weather. This marine influence moderates climatic extremes, such as the cooling that sea breezes provide in summer evenings. These breezes also help to move pollutants out of the valley. During approximately half of the days from July through September, however, a phenomenon called the “Schultz Eddy” prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern to circle back south (SMAQMD 2016). Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento area. This effect exacerbates the pollution levels in the area and increases the likelihood of violating federal and state standards. The effect normally dissipates around noon when the delta sea breeze arrives.

The mountains surrounding the valley can also contribute to elevated pollutant concentrations during periods of elevated surface inversions. These inversions are most common in late summer and in the fall. Surface inversions are formed when the air close to the surface cools more rapidly than the warm layer of air above it. Elevated inversions occur when a layer of cool air is suspended between warm air layers above and below it. Both situations result in air stagnation. Air pollutants accumulate under and within inversions, subjecting people to elevated pollution levels and associated health concerns. The surface concentrations of pollutants are highest when these conditions are combined with smoke from agricultural burning or when temperature inversions trap cool air, fog, and pollutants near the ground (SMAQMD 2016).

Criteria Air Pollutants

Criteria air pollutants are pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive people from discomfort and illness. Pollutants of concern are ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}), particulate matter equal to or less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), and lead. These pollutants are discussed below.[1] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

[1] The descriptions of the criteria air pollutants and associated health effects are based on the U.S. Environmental Protection Agency’s “Criteria Air Pollutants” (EPA 2016), the California Air Resources Board’s (CARB) “Glossary of Air Pollution Terms” (CARB 2016a), and CARB’s “Fact Sheet: Air Pollution Sources, Effects, and Control” (CARB 2009).

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and reactive organic gas (ROG) (also termed volatile organic compounds). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during late spring, summer, and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer and at the Earth's surface in the troposphere. The O_3 that the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground where people live. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to high O_3 can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, older adults, and young children.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_2 and nitric oxide are gases composed of a mixture of nitrogen and oxygen and are part of the group of compounds termed NO_x. NO_x plays a major role, together with ROGs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect terrestrial and aquatic ecosystems. The two major emissions sources of NO_2 are transportation and stationary fuel combustion sources such as electric utility and industrial boilers. NO_2 can irritate the lungs and may potentially lower resistance to respiratory infections (EPA 2016).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that affects the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air that can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) consists of particulate matter that is 10 microns or less in diameter and is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) consists of particulate matter that is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides, NO_x, and ROG.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body.

Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, chronic respiratory or cardiovascular disease, and older adults may suffer worsening illness and premature death as a result of breathing particulate matter. Premature mortality has been linked to $PM_{2.5}$ exposure even in otherwise healthy populations. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in $PM_{2.5}$ and PM_{10} (EPA 2009).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Before 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. Of particular concern is low-level lead exposure during infancy and childhood. Such exposure is associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere. Sulfates can result in respiratory impairment and reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor that has been detected near landfills, sewage plants, and hazardous waste sites due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in the air can cause nervous system effects such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide. Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$, described above.

Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. In California, specific air toxics are designated as toxic air contaminants (TACs) through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act (17 CCR 93000). This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. Federal laws use the term hazardous air pollutants (HAPs) to refer to the same types of compounds that are referred to as TACs under state law.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems, and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Asbestos is listed as a TAC by CARB and as a HAP by the EPA. Asbestos is a TAC of concern for the proposed project due to the demolition of buildings and structures. Asbestos is a fibrous mineral that is naturally occurring in ultramafic rock (a rock type commonly found in California) and is used as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, it is strictly regulated based on its natural widespread occurrence and its use as a building material. The risk of disease is dependent on the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs, and with time, may be linked to such diseases as asbestosis, lung cancer, and mesothelioma.

Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2016b). DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including more than 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-

butadiene (CARB 2016b). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) as a TAC in August 1998 (17 California Code of Regulations [CCR] 93000). DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars, and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2016b). Those most vulnerable to non-cancer health effects are children whose lungs are still developing and older adults, who also often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population, and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to an emissions source, or duration of exposure to air pollutants. The SMAQMD identifies a sensitive receptor as "facilities that house or attract children, the elderly, and people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors" (SMAQMD 2016). Recreational uses may also be considered sensitive due to the greater exposure to ambient air quality conditions because people engaging in vigorous exercise have higher breathing rates.

The nearest off-site sensitive receptors to the project are residential land uses located adjacent to the project site's eastern boundary, and San Juan High School and Sunrise Community Church and Preschool, which are located approximately 1-mile to the west and east of the project.

Existing Air Quality

Under both the federal and state Clean Air Acts, standards identifying the maximum allowable concentration of criteria air pollutants have been adopted. The EPA and CARB use air quality monitoring data to determine if each air basin or county is in compliance with the applicable standards. If the concentration of a criteria air pollutant is lower than the standard or not monitored in an area, the area is classified as attainment or unclassified (unclassified areas are treated as attainment areas). If an area exceeds the standard, the area is classified as nonattainment for that pollutant.

The EPA has designated Sacramento County as a nonattainment area for the federal 8-hour O_3 standard, and CARB has designated Sacramento County as a nonattainment area for the state 1-hour and 8-hour O_3 standards. Sacramento County has been designated as a nonattainment area for the state 24-hour and annual PM_{10} standards, and is designated as a nonattainment area for the 2006 federal 24-hour $PM_{2.5}$ standard. The SVAB is designated as unclassified or attainment for all other criteria air pollutants. The status of the SVAB with respect to the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) are summarized in Table 4.7-1.

Table 4.7-1
Sacramento Valley Air Basin Attainment Classification

Pollutant	Averaging Time	Designation/Classification	
		Federal Standards	*State Standards*
Ozone (O_3) – 1 Hour	1-hour	NA	**Nonattainment**
	8-hour	**Severe Nonattainment**	**Nonattainment**
Nitrogen Dioxide (NO_2)	1-hour, annual	Unclassifiable/Attainment	Attainment
Carbon Monoxide (CO)	1-hour, 8-hour	Attainment/Maintenance	Attainment
Sulfur Dioxide (SO_2)	1-hour	Unclassifiable/Attainment	Attainment
	24-hour	Unclassifiable	Attainment
	Annual	Unclassifiable	NA
Coarse Particulate Matter (PM_{10})	24-hour	Unclassifiable/Attainment	**Nonattainment**
	Annual	NA	**Nonattainment**
Fine Particulate Matter ($PM_{2.5}$)	24-hour	**Moderate Nonattainment**	NA
	Annual	Attainment	Attainment
Lead (Pb)	30-day	NA	Attainment
	3-month rolling	Attainment	NA
Sulfates	24-hour	No Federal Standard	Attainment
Hydrogen Sulfide	1-hour	No Federal Standard	Unclassified
Visibility-Reducing Particles	8-hour	No Federal Standard	Unclassified
Vinyl Chloride	24-hour	No Federal Standard	Unclassified

Sources: EPA 2017 (federal); CARB 2016d (state).
Notes: Bold text means nonattainment; NA = not applicable; Attainment = meets the standards; Attainment/Maintenance = achieve the standards after a nonattainment designation; Nonattainment = does not meet the standards; Unclassified or Unclassifiable = insufficient data to classify; Unclassifiable/Attainment = meets the standard or is expected to be meet the standard despite a lack of monitoring data.

4.7.2 Regulatory Setting

Federal Regulations

Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting the NAAQS for major air pollutants; setting HAP standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary-source emissions standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify national emissions standards for HAPs to protect public health and welfare. HAPs include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

State Regulations

Criteria Air Pollutants

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California EPA in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB established the CAAQS, which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, 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. Table 4.7-2 presents the NAAQS and CAAQS.

Table 4.7-2
State and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 μg/m³)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m³)	0.070 ppm (137 μg/m³)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m³)	0.100 ppm (188 μg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m³)
	24 hours	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 μg/m³	150 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m³	—	
$PM_{2.5}$[i]	24 hours	—	35 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m³	12.0 μg/m³	15.0 μg/m³
Lead[j, k]	30-day Average	1.5 μg/m³	—	—
	Calendar Quarter	—	1.5 μg/m³ (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 μg/m³	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m³)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 μg/m³)	—	—
Sulfates	24 hours	25 μg/m³	—	—

Table 4.7-2
State and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016c.

μg/m³ = micrograms per cubic meter; CO = carbon monoxide; mg/m³= milligrams per cubic meter; NO_2 = nitrogen dioxide; O_3 = ozone; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ppm = parts per million by volume; SO_2 = sulfur dioxide

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended 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. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 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 standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ 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 standard.

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

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 the public welfare from any known or anticipated adverse effects of a pollutant.

f On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.

g To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of 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 ppb to ppm. In this case, the national standard of 100 ppb is identical 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 national 1-hour 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 of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

i On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m³ to 12.0 μg/m³. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m³, as was the annual secondary standard of 15 μg/m³. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m³ were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

j The CARB has identified lead and vinyl chloride as TACs 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.

k The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m³ 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 standard are approved.

Toxic Air Contaminants

The state's Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants, pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the federal HAPs. The State Legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) in 1987 to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hot spots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment. If specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation (CARB 2012), On-Road Heavy Duty (New) Vehicle Program (CARB 2005), In-Use Off-Road Diesel Vehicle Regulation (CARB 2011), and New Off-Road Compression-Ignition (Diesel) Engines and Equipment program (CARB 2008). These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There are several Airborne Toxic Control Measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

California Health and Safety Code, Section 41700

This section of the California Health and Safety Code states that a person cannot discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

Local Regulations

Sacramento Area Council of Governments Sustainable Communities Strategy

In February 2016, the Sacramento Area Council of Governments (SACOG), the designated metropolitan planning organization for the Sacramento region, adopted the 2036 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) (SACOG 2016). The

MTP/SCS is a long-range plan for transportation projects within the planning area, and focuses on cost-effective operational improvements to preserve the existing and future regional transportation system through 2035. The 2016 update to the MTP/SCS focused on refinement of and addressing implementation challenges to the previous (2012) plan. The SACOG Board of Directors adopted five guiding policy themes—land use forecast, transportation funding, investment strategy, investment timing, and plan effects—which provide direction for the plan.

Sacramento Region Blueprint

In 2004, SACOG adopted the Preferred Blueprint Scenario for 2050 (Blueprint). The Blueprint depicts a way for the region to grow through 2050 in a manner consistent with the seven smart growth principals: (1) transportation choices, (2) mixed-use developments, (3) compact development, (4) housing choice and diversity, (5) use of existing assets, (6) quality design, and (7) natural resources conservation. The seven smart growth principals provide guidance for land use planners that, when implemented, would result in an overall reduction in vehicle miles traveled, emissions of criteria pollutants, and emissions of greenhouse gases (SACOG 2004).

Sacramento Metropolitan Air Quality Management District

The SMAQMD is the primary agency responsible for planning to meet federal and state ambient air quality standards in Sacramento County and the larger Sacramento Ozone Nonattainment Area. The SMAQMD develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The SMAQMD's air quality management plans include control measures and strategies to be implemented to attain state and federal ambient air quality standards in Sacramento County. The SMAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment. Applicable SMAQMD attainment plans include the following:

- ***Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (2013 SIP Revisions):*** The 8-Hour Ozone Attainment and Reasonable Further Program Plan (2013 Ozone Plan) describes measures to be implemented by the air districts in the Sacramento Federal Nonattainment Area to achieve the 1997 O_3 NAAQS. The 2013 Ozone Plan shows that the region continues to meet federal progress requirements and demonstrates that the region will meet the 1997 O_3 NAAQS by 2018. The 2013 Ozone Plan updates the emissions inventory, provides photochemical modeling results, updates the reasonable further progress and attainment demonstrations, revises adoption dates for control measures, and sets new motor vehicle emissions budgets for transportation conformity purposes. The 2013 Ozone Plan also includes a vehicle-miles-traveled offset demonstration that shows that the emissions reduction from transportation-control measures are sufficient to offset the emissions increase due to vehicle-miles-traveled growth (SMAQMD 2013).

- ***PM_{10} Implementation/Maintenance Plan and Redesignation Request for Sacramento County:*** On October 28, 2010, the SMAQMD Governing Board approved the PM_{10} maintenance plan and request for re-designation for the 1997 PM_{10} NAAQS (SMAQMD 2010). In 2002, the EPA officially determined that Sacramento County had attained the PM_{10} NAAQS by the December 31, 2000, attainment deadline. This plan fulfills the requirements for the EPA to re-designate Sacramento County from nonattainment to attainment of the PM_{10} NAAQS by preparing the following plan elements and tasks:
  - Document the extent of the PM_{10} problem in Sacramento County
  - Determine the emissions inventory sources contributing to the PM_{10} problem
  - Identify the appropriate control measures that achieved attainment of the PM_{10} NAAQS
  - Demonstrate maintenance of the PM_{10} NAAQS

  The EPA formally re-designated Sacramento County attainment for the federal 24-hour PM_{10} NAAQS, effective October 28, 2013.

- ***$PM_{2.5}$ Implementation/Maintenance Plan and Redesignation Request for Sacramento $PM_{2.5}$ Nonattainment Area:*** On May 9, 2012, CARB submitted a request that EPA find the Sacramento region in attainment for the 2006 24-hour $PM_{2.5}$ NAAQS. On August 14, 2013, the EPA officially determined that the Sacramento Federal Nonattainment Area had attained the 24-hour $PM_{2.5}$ NAAQS by the attainment deadline. On October 24, 2013, the SMAQMD, El Dorado County Air Quality Management District, Placer County Air Pollution Control District, and Yolo-Solano Air Quality Management District approved the $PM_{2.5}$ maintenance plan and request for re-designation for the 2006 $PM_{2.5}$ NAAQS (SMAQMD et al. 2013) to meet the EPA re-designation requirements.

- ***2015 Triennial Report and Air Quality Plan Revision:*** This plan is intended to comply with the requirements of the California Clean Air Act related to bringing the region into compliance with the CAAQS for O_3. The SMAQMD has prepared several triennial progress reports that build on the 1994 Sacramento Area Regional Ozone Attainment Plan. The 2015 Triennial Report and Air Quality Plan Revision (SMAQMD 2015) is the most recent report. The triennial progress report describes historical trends in air quality, includes updated emissions inventories, and identifies feasible control measures that the SMAQMD will study or adopt over the triennial period.

- ***2016 Annual Progress Report:*** This plan is intended to comply with the requirements of the California Health and Safety Code Section 40924(a), which requires air districts to prepare an annual progress report and submit the report to CARB summarizing progress in meeting the schedules for developing, adopting, and implementing the air pollution control measures contained in the SMAQMD triennial reports. The most current update to this report by the SMAQMD is the 2016 Annual Progress Report Plan (SMAQMD 2017). The 2016 Annual Progress Report provides updates on emissions reduction programs, adopted or implemented control measures, and evaluation of further study measures in 2016, which were included in the 2015 Triennial Report and Air Quality Plan Revision. Since the SMAQMD has attained the CO, SO_2, and NO_2 standards, the report focuses on the emissions reductions of O_3 precursors: ROG and NO_X.

In addition, the SMAQMD has several rules that relate to the project, summarized below:

Rule 401 – Ringelmann Chart/Opacity: Prohibits individuals from discharging into the atmosphere from any single source of emissions whatsoever any air contaminant whose opacity exceeds certain specified limits.

Rule 402 – Nuisance: To protect the public health, Rule 402 prohibits any person from discharging such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public.

Rule 403 – Fugitive Dust: Requires a person to take every reasonable precaution not to cause or allow the emissions of fugitive dust from being airborne beyond the property line from which the emission originates; from construction, handling, or storage activity; or any wrecking, excavation, grading, clearing of land, or solid waste disposal operation.

Rule 442 – Architectural Coatings: Sets volatile organic compound limits for coatings that are applied to stationary structures or their appurtenances. The rule also specifies storage and cleanup requirements for these coatings.

Rule 453 – Cutback and Emulsified Asphalt Paving Materials: Asphalt paving operations that may be associated with implementation of the project would be subject to Rule 453. This rule applies to the manufacture and use of cutback asphalt and emulsified asphalt for paving and maintenance operations.

Rule 902 – Asbestos: Establishes survey, notification, and work practice requirements to prevent asbestos emissions during building demolition.

City of Citrus Heights General Plan

The City of Citrus Heights (City) updated its General Plan in August 2011. Applicable air quality goals and policies from Chapter 4, Community Health, are listed below (City of Citrus Heights 2011b):

Goal 53: Protect and improve air quality in the Citrus Heights area to the maximum extent possible.

Policy 53.2: Minimize the impacts of vehicle emissions on air quality.

Policy 53.4: Enable use of electric (rather than gasoline-powered) equipment and natural gas appliances, including outdoor grills.

Goal 54: Integrate air quality planning with land use and transportation planning.

Policy 54.1: Encourage alternative modes of transportation and trip-reducing strategies such as telecommuting and mixed-use development.

4.7.3 Impacts

Methods of Analysis

Development of the project could potentially be detrimental to air quality during the construction and operation phases. Construction activities would result in criteria pollutant emissions from site grading activities, building construction, application of architectural coatings, and vehicle and construction equipment exhaust. Project operation would result in criteria pollutant emissions primarily from vehicular sources; however, landscape maintenance equipment, heating sources (e.g., natural gas heaters), and other miscellaneous activities would also generate pollutant emissions. The CalEEMod land use and emissions modeling program was used to estimate air pollutant emissions that would be generated during construction and operation of the project. These are compared to the applicable SMAQMD criteria pollutant thresholds to determine whether there would be significant air quality impacts.

Significance Criteria

The significance criteria used to evaluate project impacts are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), the SMAQMD thresholds. A significant impact related to air quality would occur if:

- The amount of air pollutants emitted from the implementation of the project would cause or contribute to a localized exceedance of any ambient air quality standard (Table 4.7-2 provides a summary of ambient air quality standards) or would exceed the following significance emission thresholds set forth by the SMAQMD:
    - short-term (construction) emissions of NO_x above 85 pounds per day, or PM_{10} above 80 pounds per day, or $PM_{2.5}$ above 82 pounds per day if all feasible best available control technology or best management practices are applied;
    - long-term (operational) emissions of NO_x or ROG above 65 pounds per day, or PM_{10} above 80 pounds per day, or $PM_{2.5}$ above 82 pounds per day if all feasible best available control technology or best management practices are applied;
    - CO concentrations that exceed the 1-hour state ambient air quality standard (i.e., 20 parts per million) or the 8-hour state ambient standard (i.e., 9 parts per million).

- Implementation of the project would conflict with or obstruct implementation of the applicable air quality plan or the goals of the SMAQMD.
- The project would result in a cumulatively considerable net increase of any criteria pollutant for which the project area is in non-attainment under an applicable federal or state ambient air quality standard (including the release of emissions that exceed quantitative thresholds for O_3 precursors).
- The project would result in TAC exposures that create a lifetime cancer risk exceeding 10 in 1 million for stationary sources, or substantially increase the lifetime cancer risk as a result of increased exposure to TACs from mobile sources.

The proposed project would construct a residential subdivision and associated recreational amenities. None of the proposed land uses typically generate objectionable odors that could adversely affect existing or planned residences. Therefore, potential odor impacts are not evaluated in this EIR.

Project Impacts

IMPACT 4.7-1:	Generate air pollutant emissions that would cause or contribute to a localized exceedance of any ambient air quality standard or exceed SMAQMD's emission thresholds
SIGNIFICANCE:	Potentially Significant
MITIGATION MEASURE:	Mitigation Measure 4.7a
SIGNIFICANCE AFTER MITIGATION:	Less Than Significant

Construction Emissions

Construction of the project would result in a temporary addition of pollutants to the local air shed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, off-site trucks hauling demolition debris and excavated earth materials, and construction workers travelling to and from the site. Construction emissions can vary substantially from day to day depending on the level of activity and the specific type of operation, and, for dust, the prevailing weather conditions. Therefore, an increment of day-to-day variability exists.

Pollutant emissions associated with construction activities were quantified using CalEEMod. Default values provided by the program were used where detailed project information was not available. A detailed depiction of the construction schedule—including information regarding phasing, equipment used during each phase, haul trucks, vendor trucks, and worker vehicles—is contained in the CalEEMod outputs, provided in Appendix E.

Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. The project would be required to comply with SMAQMD's Basic Construction Emission Control Practices, which are required for all construction activities within the SMAQMD jurisdiction. These measures include watering the construction site twice daily, limiting vehicle speeds on unpaved roadways to 15 miles per hour, minimizing vehicle idling, covering haul trucks transporting soil, and cleaning paved roads (SMAQMD 2009). Internal combustion engines used by construction equipment and haul trucks, vendor trucks, and worker vehicles would result in emissions of ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$.

It is anticipated that construction of the project would require four years of construction. For the CalEEMod modeling, it was assumed that construction would occur from August 2018 through April 2022. For purposes of estimating project emissions and based on information provided by the project applicant, it is assumed that construction activity would occur continuously and over four phases. Detailed construction timeline information is available in Appendix E. Demolition was expected to occur in phases 1 and 2. Each phase is also expected to include approximately 5 days of site preparation, grading for between 20 and 36 days, trenching for utilities for between 50 and 60 days, paving for 20 days, building construction for 140 days, and architectural coating for 20 days. Trail construction was assumed to occur concurrent with the first two building phases and would include site preparation, grading, and paving.

CalEEMod was used to quantify construction NO_x, PM_{10}, and $PM_{2.5}$ emissions from off-road equipment, haul trucks associated with demolition and soils export, on-road worker vehicle emissions, and vendor delivery trips. Predicted construction emissions for the worst-case day for each of the construction years are presented in Table 4.7-3 and compared to the SMAQMD threshold.

Table 4.7-3
Estimated Maximum Daily Construction Emissions

Year	NO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day		
2018	77.01	10.84	6.88
2019	45.63	10.66	6.71
2020	59.00	10.47	6.53
2021	27.34	3.86	2.05
2022	14.24	1.13	0.77
Maximum Daily	**77.01**	**10.84**	**6.88**
Pollutant Threshold	*85*	*80*	*82*
Threshold Exceeded?	**No**	**No**	**No**

Source: See Appendix E for detailed results.
NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter
Notes: These estimates reflect implementation of SMAQMD Basic Construction Emission Control Practices. SMAQMD has adopted construction thresholds for NO_x, PM_{10}, and $PM_{2.5}$.
The values shown are the maximum summer or winter daily emissions results from CalEEMod.

As noted above, all construction projects in the SMAQMD jurisdiction are required to implement SMAQMD's Basic Construction Emission Control Practices and are required to comply with District Rules and Regulations, including those identified in Section 4.7.2, Regulatory Setting, above. These requirements are expressed in Mitigation Measure 4.7a to ensure that construction emissions are reduced to the extent feasible, consistent with the SMAQMD rules. As shown in Table 4.7-3, daily construction emissions would not exceed the SMAQMD significance thresholds for NO_x, PM_{10}, or $PM_{2.5}$ during construction in all construction years. Therefore, construction impacts of the project would be **less than significant** and no mitigation measures are required.

Operational Emissions

Following the completion of construction activities, the project would generate criteria pollutant emissions from vehicular traffic, area sources (consumer products, architectural coatings, landscaping equipment), and energy sources (natural gas appliances, space and water heating). Emissions associated with on-road mobile sources include running and starting exhaust emissions, evaporative emissions, brake and tire wear, and fugitive dust from roads. Default trip generation rates included in CalEEMod for each analyzed land use for the project were adjusted to match the total trips resulting from the project. Furthermore, the traffic study (Appendix C) included trip reductions from alternative transportation methods, including pedestrian, bicycle, and transit trips, and from existing vehicle trips to the project site. The project would result in 1,561 net trips per weekday. Emissions from energy sources include natural gas combustion for appliances and space and water heating. The project would also be required to comply with the 2016 Title 24 standards which have been incorporated in CalEEMod. Area sources include gasoline-powered landscape maintenance equipment, consumer products, and architectural coatings for the maintenance of buildings. CalEEMod was used to estimate daily emissions from operational sources without the application of any mitigation measures. The estimated daily emissions from project operation are shown in Table 4.7-4.

Table 4.7-4
Estimated Unmitigated Maximum Daily Operational Emissions

Source	ROG	NO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day			
Area	11.07	0.25	0.12	0.12
Energy	0.17	1.46	0.12	0.12
Mobile	2.69	8.17	5.89	1.61
Total	**13.93**	**9.88**	**6.13**	**1.85**
Pollutant Threshold	*65*	*65*	*80*	*82*
Threshold Exceeded?	**No**	**No**	**No**	**No**

Source: See Appendix E for detailed results.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter

These estimates reflect implementation of adjusted trip rates per the traffic study by Fehr and Peers (Appendix C), which includes trip reductions from alternative methods of transportation, use of low-volatile-organic-compound architectural coatings, low flow water fixtures, compliance with 2016 Title 24 standards, and a 75% waste diversion rate. SMAQMD has adopted operational thresholds for ROG, NO_x, PM_{10}, and $PM_{2.5}$.
The values shown are the maximum summer or winter daily emissions results from CalEEMod.

As shown in Table 4.7-4, ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions would be substantially below the SMAQMD threshold of significance. Because the project would not exceed the SMAQMD thresholds during operation, the project would result in a **less-than-significant impact**.

IMPACT 4.7-2:	Conflict with or obstruct implementation of the applicable air quality plan or the goals of the SMAQMD
SIGNIFICANCE:	Less Than Significant
MITIGATION MEASURE:	None Required
SIGNIFICANCE AFTER MITIGATION:	Less Than Significant

The Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (2013 SIP Revisions) addresses attainment of the federal 8-hour ozone standard (SMAQMD 2013), and the 2016 Annual Progress Report (SMAQMD 2017) provides updates on emission reduction programs, adopted or implemented control measures, and evaluation of further study measures established in the 2015 Triennial Report and Air Quality Plan Revision (SMAQMD 2015), which addresses attainment of the California 1-hour and 8-hour O_3 standards. These are the latest plans issued by the SMAQMD, and they incorporate land use assumptions and travel demand modeling provided by SACOG. The purpose of a consistency finding is to determine if a project is inconsistent with the assumptions and objectives of a regional air quality plan, and, thus, would interfere with the region's ability to comply with federal and state air quality standards. In general, projects are considered consistent with, and would not conflict with or obstruct implementation of, an air quality plan if the growth in socioeconomic factors is consistent with the underlying regional plans used to develop the air quality management plan.

Demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) were developed by SACOG for its MTP/SCS (SACOG 2016) based on general plans for cities and counties in the SVAB. The air quality management plans rely on the land use and population projections provided in the MTP/SCS, which is generally consistent with the local plans; therefore, the air quality management plans are generally consistent with local government plans.

As discussed in Section 4.1, Land Use, the project applicant is requesting the site be designated for Medium Density Residential and Open Space. The zoning designations for the project site, pursuant to the City of Citrus Heights Zoning Map, are Commercial Recreation, Limited Commercial, Shopping Center, and High Density Residential (City of Citrus Heights 2017).

Since the project would re-designate 15.77 acres of commercial uses to residential, this would increase the total amount of residential land uses that could be accommodated within the City, and reduce the total amount of commercial uses in the City. As noted in Section 4.2, Population and Housing, the City's Housing Element (City of Citrus Heights 2013) assumed that the project site could accommodate 93 multi-family dwelling units. The project would construct 167 additional dwelling units than anticipated for the site. A reduction in the amount of available commercial uses would slightly decrease the City's total capacity for construction of new commercial space. However, the increase in residential capacity and decrease in commercial capacity would not substantially alter the City's anticipated land uses in the local area or in the City overall. Therefore, the project would not generate substantial population growth that was not accounted for in the City's General Plan or SACOG's MTP/SCS, and impacts relating to the project's potential to conflict with or obstruct implementation of the applicable air quality management plan would be **less than significant.**

IMPACT 4.7-3:	Result in a cumulatively considerable net increase of any criteria pollutant for which the project area is in nonattainment under an applicable federal or state ambient air quality standard (including the release of emissions that exceed quantitative thresholds for ozone precursors)
SIGNIFICANCE:	Less Than Significant
MITIGATION MEASURE:	None Required
SIGNIFICANCE AFTER MITIGATION:	Less Than Significant

The Sacramento Federal Nonattainment Area is nonattainment for O_3 and particulate matter. Due to its nonattainment status for the federal and state O_3 standards, the geographic scope of the area for the project's cumulative analysis includes the areas within the Sacramento Federal Nonattainment Area for O_3. Ongoing development and operation of new land uses would generate additional emissions of O_3 precursors and particulate matter, which may adversely affect the ability of the region to achieve attainment with applicable air quality standards. This would be a significant cumulative impact.

The SMAQMD Guide to Air Quality Assessment describes cumulative air quality issues as follows (SMAQMD 2016):

> By its very nature, air pollution is largely a cumulative impact. Ambient air quality standards are violated or approach nonattainment levels due to past development that has formed the urban fabric, and attainment of standards can be jeopardized by increasing emissions-generating activity in the region. The

> nonattainment status of regional pollutants is a result of past and present development within the SVAB. Thus, this regional impact is a cumulative impact, and projects would contribute to this impact only on a cumulative basis. No single project would be sufficient in size, by itself, to result in nonattainment of the regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects.

Given this background, the SMAQMD Guide to Air Quality Assessment describes a step-by-step approach to evaluating a project's contribution to cumulative impacts. The following discussion evaluates the potential for the project's construction and operational emissions to result in a considerable contribution to the region's cumulative air quality impact.

Ozone Precursor Emissions

Construction: In accordance with the SMAQMD guidance, a project whose construction emissions would not exceed the NO_x significance threshold would not be considered cumulatively considerable and would be less than significant. As discussed in Impact 4.7-1, the project's NO_x construction emissions would not exceed the threshold, and, therefore, the project's emissions of O_3 precursors would not be considerable and the project's contribution to the cumulative impact would be **less than significant**.

Operation: In accordance with the SMAQMD guidance, a project whose operational emissions would not exceed the NO_x or ROG significance thresholds would not be considered cumulatively considerable and would be less than significant. As discussed in Impact 4.7-1, project operation would not generate NO_x or ROG emissions that would exceed the threshold of significance. Therefore, the project's emissions of O_3 precursors would not be considerable and the project's contribution to a cumulative impact would be **less than significant**.

Particulate Matter Emissions

Construction: In accordance with the SMAQMD guidance, a project that implements the SMAQMD basic construction emissions control practices and whose construction emissions would not exceed the PM_{10} or $PM_{2.5}$ significance thresholds would not be cumulatively considerable and would be less than significant. As discussed in Impact 4.7-1, the project would implement the SMAQMD basic construction emissions control practices and would result in PM_{10} and $PM_{2.5}$ emissions that would not exceed the respective threshold; therefore, the project's emissions of PM_{10} and $PM_{2.5}$ would not be considerable and the project's contribution to the cumulative impact would be **less than significant**.

Operation: In accordance with the SMAQMD guidance, a project whose operational emissions would not exceed the PM_{10} or $PM_{2.5}$ significance thresholds would not be considered cumulatively considerable and would be less than significant. As discussed in Impact 4.7-1, the project's operation would not generate PM_{10} or $PM_{2.5}$ emissions that exceed the respective threshold of significance. Therefore, the project's emissions of PM_{10} and $PM_{2.5}$ would not be considerable, and the project's contribution to the cumulative impact would be **less than significant**.

IMPACT 4.7-4:	Result in the exposure of sensitive receptors to substantial pollutant concentrations
SIGNIFICANCE:	Less Than Significant
MITIGATION MEASURE:	None Required
SIGNIFICANCE AFTER MITIGATION:	Less Than Significant

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts upon those people termed "sensitive receptors" are the most serious hazards of existing air quality conditions. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes.

Toxic Air Contaminants

TACs are defined as substances that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. The nearest sensitive receptors to the project site are single-family residences located adjacent to the proposed construction boundary. Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The SMAQMD recommends an incremental cancer risk threshold of 10 in 1 million (SMAQMD 2016). "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period would contract cancer based on the use of standard Office of Environmental Health Hazard Assessment (OEHHA) risk-assessment methodology (OEHHA 2015). In addition, some TACs have non-carcinogenic effects. The SMAQMD recommends a Hazard Index of 1 or more for acute (short-term) and chronic (long-term) effects (SMAQMD 2016).[2] TACs that would potentially be emitted during demolition and construction activities associated with project development would be asbestos and Diesel Particulate Matter (DPM).

DPM emissions would be emitted from heavy-duty construction equipment and heavy-duty trucks. Heavy-duty construction equipment and diesel trucks are subject to CARB Airborne Toxic Control Measures (described in Section 4.7.2, Regulatory Setting) to reduce DPM emissions. According to the OEHHA, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period for the maximally exposed individual resident; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2015). Thus, the duration of proposed construction activities would only constitute a small percentage of the total 30-year exposure period. The construction period for the project would total approximately 3.5 years, after which construction-related TAC emissions would cease. The approximate 3.5-year construction duration represents 12% of the total 30-year exposure period. Due to this relatively short period of exposure and minimal particulate emissions on site, as shown in Table 4.7-3, TACs generated during construction would not be expected to result in concentrations causing significant health risks.

In regards to operations, the proposed project would not include stationary sources that would emit air pollutants or TACs, such as commercial uses that could generate emissions, large boilers, emergency generators, or manufacturing facilities or result in a substantial amount of diesel vehicles (i.e., delivery trucks). Thus, the project would not result in emissions of TACs from such stationary sources. Therefore, TACs generated during operations would not be expected to result in concentrations causing significant health risks because the project would result in minimal number of delivery trucks that would travel to the project, in addition to not exceeding the SMAQMD significance thresholds for particulate matter as shown in Table 4.7-4

Health Impacts of Criteria Air Pollutants

Construction of the project would generate criteria air pollutant emissions; however, the project would not exceed the SMAQMD mass-emission thresholds. The SVAB is a nonattainment area for O_3, PM_{10}, and $PM_{2.5}$ under the NAAQS and/or CAAQS.

Volatile organic compounds and NOx are precursors to O_3, for which the SVAB is designated as nonattainment with respect to the NAAQS and CAAQS. Thus, existing O_3 levels in the SVAB are at unhealthy levels during certain periods. The health effects associated with O_3 are generally

2 Noncancer adverse health risks are measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentrations of the various non-carcinogens from the project to published reference exposure levels that can cause adverse health effects.

associated with reduced lung function. Because the project would involve construction and operational activities that would not result in volatile organic compound or NOx emissions that would exceed the SMAQMD thresholds, the project is not anticipated to substantially contribute to regional O_3 concentrations and the associated health impacts.

In addition to O_3, NOx contributes to potential exceedances of the NAAQS and CAAQS for NO_2. The existing ambient NO_2 concentrations are below the NAAQS and CAAQS. Thus, project construction and operation is not expected to exceed the NO_2 standards or contribute to the associated health effects, which are primarily associated with respiratory irritation.

According to the EPA, particulate matter contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particulate matter 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 2016). As with O_3 and NOx, the project would not generate emissions of PM_{10} or $PM_{2.5}$ that would exceed the SMAQMD's thresholds. Accordingly, the project's PM_{10} and $PM_{2.5}$ emissions are not expected to cause an increase in related regional health effects for these pollutants.

In summary, the proposed project would not result in substantial emissions or exposure of sensitive receptors to TACs during construction or operation. In addition, the project would not result in a potentially significant contribution to regional concentrations of non-attainment pollutants, and would not result in a significant contribution to the adverse health impacts associated with those pollutants. Therefore, the project would have a **less-than-significant impact** related to exposure of sensitive receptors to substantial pollutant concentrations.

4.7.4 Mitigation Measures

Mitigation Measure 4.7a: Prior to issuance of demolition permits, grading permits, or building permits for the proposed project, the City of Citrus Heights shall ensure that site plan notes include requirements for the contractor to implement the following Basic Construction Emission Control Measures. Visual site inspections shall be conducted throughout construction to ensure these measures are implemented appropriately:

A. All exposed surfaces shall be watered two times daily. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.

B. Haul trucks transporting soil, sand, or other loose material on the site shall be covered and/or shall maintain at least two feet of free board space. Any haul trucks that would be traveling along freeways or major roadways shall be covered.

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

D. Vehicle speeds on unpaved roads to shall be limited to a maximum of 15 miles per hour.

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

4.7.5 References

13 CCR 2025. Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen, and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles.

13 CCR 2449–2449.3 and Appendix A. General Requirements for In-Use Off-Road Diesel-Fueled Fleets.

17 CCR 93000. Substances Identified as Toxic Air Contaminants. In Subchapter 7, Toxic Air Contaminants.

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