3.3 Air Quality

3.3.1 Introduction

This section evaluates the potential effects on air quality associated with development and operation of the Yosemite Avenue-Gardner Avenue to Hatch Road Annexation Project (proposed project). This section describes the existing air quality conditions around the project site; outlines applicable federal, state, and regional regulations pertaining to air quality; and identifies potential project-specific and cumulative impacts on air quality and measures to minimize these impacts.

As discussed in Chapter 1, Introduction, a Notice of Preparation (NOP) for this Environmental Impact Report (EIR) was initially published in December 2016 based on the original project applications. In 2019, the project applicant submitted revised applications and site plans, increasing the number of residential units from 330 to 540 and increasing the amount of onsite parking. The City issued a revised NOP in May 2020. The San Joaquin Valley Air Pollution Control District (SJVAPCD) submitted a comment letter that provides regulatory information but does not identify any project-specific concerns. The NOPs and all comments received in response to them are provided in Appendix A.

Key resources referenced to prepare this section include the Merced Vision 2030 General Plan (City of Merced 2012), the Merced County 2030 General Plan (Merced County 2013), and the SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015a). In addition, Dudek completed modeling of the air pollutant emissions associated with project construction and operation using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 (CAPCOA 2017). The CalEEMod modeling is provided in Appendix D.

3.3.2 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 San Joaquin Valley Air Basin (SJVAB), which consists of eight counties and is spread across 25,000 square miles of Central California. The SJVAB is bordered on the east by the Sierra Nevada (8,000–14,491 feet in elevation), on the west by the Coast Ranges (averaging 3,000 feet in elevation), and to the south by the Tehachapi Mountains (6,000–7,981 feet in elevation). In the north, it extends to the northern boundary of San Joaquin County (SJVAPCD 2015a).

The San Joaquin Valley comprises the southern half of California's Central Valley, is approximately 250 miles long, and averages 35 miles wide with a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the San Joaquin Valley opens to the San Francisco Bay at the Carquinez Strait. Its northern end in the Sacramento Valley comprises the northern half of California's Central Valley.

The region's topographic features restrict air movement through and out of the SJVAB. As a result, the SJVAB is highly susceptible to pollutant accumulation over time.

Climate and Topography

The San Joaquin Valley is in a Mediterranean Climate Zone, influenced by a subtropical high-pressure cell most of the year and characterized by warm, dry summers and cooler winters. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in winter. Summertime maximum temperatures in the San Joaquin Valley often exceed 100 degrees Fahrenheit (°F). The SJVAB averages 10.6 inches of precipitation per year (WRCC 2017).

The vertical dispersion of air pollutants in the San Joaquin Valley can be limited by the presence of persistent temperature inversions. Air temperatures usually decrease with an increase in altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. A temperature inversion can act like a lid, restricting vertical mixing of air above and below an inversion because of differences in air density and thereby trapping air pollutants below the inversion. The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in air temperature inversions. Most of the surrounding mountains are above the normal height of summer inversions (1,500–3,000 feet). Wintertime high-pressure events can often last many weeks with surface temperatures lowering into 30°F–40°F. During these events, fog can be present and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutant to a few hundred feet.

Wind speed and direction play an important role in dispersion and transport of air pollutants. Winds in the San Joaquin Valley most frequently blow from the northwesterly direction, especially in the summer. The region's topographic features restrict air movement and channel the air mass towards the southeastern end of the San Joaquin Valley. Marine air can flow into the SJVAB from the Sacramento–San Joaquin River Delta and over Altamont Pass and Pacheco Pass. From there, it can flow through the San Joaquin Valley, over the Tehachapi Pass, and into the Mojave Desert Air Basin. The Coastal Range and the Sierra Nevada are barriers to air movement to the west and east, respectively. A secondary but significant summer wind pattern is from the southeasterly direction and can be associated with nighttime drainage winds, prefrontal conditions, and summer monsoons. During winter, winds can be very weak, which minimizes the transport of pollutants and results in stagnation events.

Two significant diurnal wind cycles that occur frequently in the San Joaquin Valley are the sea breeze and mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the San Joaquin Valley. In the mountains during periods of weak synoptic scale winds, winds tend to be upslope during the day and downslope at night.

Nighttime and drainage flows are pronounced during the winter when flow from the easterly direction is enhanced by nighttime cooling in the Sierra Nevada. Eddies can form in the valley wind flow and can recirculate a polluted air mass for an extended period.

Solar radiation and temperature are particularly important in the chemistry of ozone (O_3) formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily O_3) results from the atmospheric ROGs and NO_2 under the influence of sunlight. O_3 concentrations are very dependent on the amount of solar radiation, especially during late spring, summer and early fall. O_3 levels typically peak in the afternoon. After the sun goes down, the chemical reaction between N_2O and O_3 begins to dominate. This reaction tends to reduce O_3 concentrations in the metropolitan areas through the early morning hours. At sunrise, NO_x tends to peak, partly due to low levels of O_3 at this time and also due to the morning commuter vehicle emissions of NO_x.

Reaction rates generally increase with temperature, which results in greater O_3 production at higher temperatures. However, extremely hot temperatures can "lift" or "break" the inversion layer. Typically, if the inversion layer remains intact, O_3 levels peak in the late afternoon. If the inversion layer breaks and the resultant afternoon winds occur, O_3 levels peak in the early afternoon and decrease in the late afternoon as the contaminants are dispersed or transported out of the SJVAB. O_3 levels are low during winter periods when there is much less sunlight to drive the photochemical reaction.

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.

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

[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).

the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) [2] 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

[2] NO_x is a general term pertaining to compounds of nitric oxide (NO), NO_2 and other oxides of nitrogen.

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.

Valley Fever. Coccidioidomycosis, more commonly known as "Valley Fever," is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. The spores can be found in some areas, naturally occurring in soils, can become airborne when the soil is disturbed, and can subsequently be inhaled into the lungs. Valley Fever symptoms occur within two to three weeks of exposure. Approximately 60% of Valley Fever cases are mild and display flu-like symptoms or no symptoms at all. The fungus is very prevalent in the soils of California's San Joaquin Valley, including in Merced County. Merced County had more than 15 cases annually of Valley Fever per 100,000 people based on the incidence rates reported from 2008 to 2012 (California Department of Public Health 2017). Coccidioides is thought to grow best in soil after heavy rainfall and then disperse into the air most effectively during hot, dry conditions. New residents to the San Joaquin Valley have usually never been exposed to Valley Fever, and as a result are particularly susceptible to the infection. Many longtime residents of the area have at some time been exposed to the fungus, become infected, and have recovered, and are thus immune.

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 San Joaquin Valley Air Pollution Control District (SJVAPCD) considers hospitals, schools, parks, playgrounds, daycare centers, nursing homes, convalescent facilities, and residential areas as sensitive receptor land uses (SJVAPCD 2015b).

As discussed in Chapter 2, Project Description, the proposed project involves annexation of an approximately 68.6-acre site to the City of Merced, changes in General Plan and zoning designations for the site, and development of a mixed-use community called The Crossings on approximately 28.4 acres of the site. The approximately 40.2 acres of the site not included in The Crossings development are referred to in this EIR as the Remainder Area. With respect to The Crossings portion of the project site, the nearest sensitive receptors are the residences within the Remainder Area of the project site as well as the residential land uses located approximately 30 feet north of the project site's northern boundary. There are also residences across Gardner Avenue on the project's western boundary and residences to the south across Yosemite Avenue on the project's southern boundary. With respect to the Remainder Area of the project site, the nearest existing sensitive receptors are the residential land uses on the east side of Hatch Avenue and those north of the project site along Hatch Avenue. Future residents of The Crossings portion of the project would also be sensitive receptors in close proximity to the Remainder Area.

Existing Air Quality

Both the federal and state Clean Air Acts have established standards identifying the maximum allowable concentration of criteria air pollutants. The U.S. 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 the SJVAB as a nonattainment area for the federal 8-hour O_3 standard, and CARB has designated the SJVAB as a nonattainment area for the state 1-hour and 8-hour O_3 standards. The SJVAB has been designated as a nonattainment area for the state 24-hour and annual PM_{10} standards, nonattainment area for the federal 24-hour and annual $PM_{2.5}$ standards, and nonattainment area for the state annual $PM_{2.5}$ standard. The SJVAB is designated as unclassified or attainment for the other criteria air pollutants. The status of the SJVAB with respect to the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air

Quality Standards (CAAQS) are summarized in Table 3.3-1, San Joaquin Valley Air Basin Attainment Status (Merced County.

Table 3.3-1
San Joaquin Valley Air Basin Attainment Status (Merced County)

Pollutant	Designation/Classification	
	Federal Standards	*State Standards*
Ozone (O_3) – 1-hour	No federal standard[1]	Nonattainment/severe
Ozone (O_3) – 8-hour	Nonattainment/extreme[2]	Nonattainment
Nitrogen dioxide (NO_2)	Unclassifiable/attainment	Attainment
Carbon monoxide (CO)	Unclassifiable/attainment	Attainment
Sulfur dioxide (SO_2)	Unclassifiable/attainment	Attainment
Respirable particulate matter (PM_{10})	Attainment[3]	Nonattainment
Fine particulate matter ($PM_{2.5}$)	Nonattainment[4]	Nonattainment
Lead (Pb)[5]	Unclassifiable/attainment	Attainment
Sulfates (SO_4)	No federal standard	Attainment
Hydrogen sulfide (H_2S)	No federal standard	Unclassified
Vinyl chloride[5]	No federal standard	No designation
Visibility-reducing particles	No federal standard	Unclassified

Sources: SJVAPCD 2015a; EPA 2016b; CARB 2017a.
Notes: 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.

1 Effective June 15, 2005, the EPA revoked the federal 1-hour O_3 standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the *2004 Extreme Ozone Attainment Demonstration Plan* (SJVAPCD 2004) on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour O_3 nonattainment areas continue to apply to the SJVAB.

2 Though the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour O_3 standard, EPA approved San Joaquin Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

3 On September 25, 2008, EPA re-designated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan.

4 The San Joaquin Valley is designated nonattainment for the 1997 $PM_{2.5}$ NAAQS. EPA designated the San Joaquin Valley as nonattainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).

5 CARB has identified Pb and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined.

Under authority and oversight from the EPA pursuant to 40 Code of Federal Regulations (CFR) Part 58, the SJVAPCD and CARB maintain ambient air quality monitoring stations throughout the SJVAB, and the SJVAPCD currently operates 22 monitoring stations. In addition, the SJVAPCD gathers air quality data from a variety of monitoring sites from other contracted agencies (e.g., United States Marine Corps). Air quality monitoring stations usually measure pollutant

concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Not all air pollutants are monitored at each station; thus, data are summarized from the closest representative station that monitors a specific pollutant.

The closest ambient air quality monitoring station to the project site that monitors O_3, NO_x, PM_{10}, and $PM_{2.5}$ is the Coffee Avenue monitoring station, located at 385 South Coffee Avenue, Merced, California 95340, approximately 4 miles to the south of the proposed project. The data collected at this station are considered representative of the air quality experienced in the project vicinity. The closest monitoring station for SO_2 is the First Street monitoring station in Fresno, 52 miles to the south. The closest monitoring station for CO is the monitoring station in Madera, 33 miles to the south. The most recent background ambient air quality data from 2016 to 2018 and the number of days exceeding the ambient air quality standards are presented in Table 3.3-2, Local Ambient Air Quality Data.

Table 3.3-2
Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2016	*2017*	*2018*	*2016*	*2017*	*2018*
Ozone (O_3) – Merced									
Maximum 1-hour Concentration	ppm	State	0.09	0.097	0.093	0.104	2	0	4
Maximum 8-hour Concentration	ppm	State	0.070	0.087	0.085	0.0840	29	17	23
		Federal	0.070	0.086	0.084	0.083	28	16	21
Nitrogen Dioxide (NO_2) – Merced									
Maximum 1-hour Concentration	ppm	State	0.18	0.035	0.039	0.046	0	0	0
		Federal	0.100	0.035	0.038	0.045	0	0	0
Annual Concentration	ppm	State	0.030	0.006	0.007	0.007	0	0	0
		Federal	0.053	0.007	0.007	0.007	0	0	0
Carbon Monoxide (CO) – Madera									
Maximum 1-hour Concentration	ppm	State	20	5.1	3.1	1.9	0	0	0
		Federal	35	5.1	3.1	1.9	0	0	0
Maximum 8-hour Concentration	ppm	State	9.0	1.4	1.2	1.2	0	0	0
		Federal	9	1.4	1.2	1.2	0	0	0
Sulfur Dioxide (SO_2) – Fresno									
Maximum 1-hour Concentration	ppm	Federal	0.075	0.008	0.008	0.007	0	0	0

Table 3.3-2
Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2016	*2017*	*2018*	*2016*	*2017*	*2018*
Maximum 24-hour Concentration	ppm	State	0.04	0.002	0.002	0.003	0	0	0
	ppm	Federal	0.140	0.002	0.002	0.003	0	0	0
Annual Concentration	ppm	Federal	0.030	0.005	0.06	0.006	0	0	0
Coarse Particulate Matter (PM_{10})[b] – Merced									
Maximum 24-hour Concentration	□g/m^3	State	50	64.5	144.0	142.7	38.9 (6)	76.6 (12)	59.6 (10)
		Federal	150	64.3	146.6	137.0	0	0	0
Annual Concentration	□g/m^3	State	20	29.5	35.8	34.6	—	—	—
Fine Particulate Matter ($PM_{2.5}$)[b] – Merced									
Maximum 24-hour Concentration	□g/m^3	Federal	35	43	69.3	88.2	5.2 (5)	18.7 (18)	21.2 (21)
Annual Concentration	□g/m^3	State	12	11.9	13.2	15.1	—	—	—
		Federal	12.0	11.9	13.2	15.1	—	—	—

Sources: CARB 2018a; EPA 2018a.
Notes: — = not available; μg/m3 = micrograms per cubic meter; ND = insufficient data available to determine the value; ppm = parts per million
Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of federal and state standards are only shown for O_3, particulate matter, and Carbon Monoxide. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
[a] Mean does not satisfy minimum data completeness criteria.
[b] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

3.3.3 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; both are shown in Table 3.3-3, State and National Ambient Air Quality Standards. 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 3.3-3
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/m^3)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	None
	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m^3)
	24 hours	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 μg/m^3	150 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m^3	—	
$PM_{2.5}$[i]	24 hours	—	35 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m^3	12.0 μg/m^3	15.0 μg/m^3
Lead[j, k]	30-day Average	1.5 μg/m^3	—	—
	Calendar Quarter	—	1.5 μg/m^3 (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 μg/m^3	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m^3)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 μg/m^3)	—	—
Sulfates	24 hours	25 μg/m^3	—	—

Table 3.3-3
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.

Acronyms and Notes: μg/m^3 = micrograms per cubic meter; CO = carbon monoxide; mg/m^3= 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/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 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/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 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/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 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. Additionally, 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 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

San Joaquin Valley Air Pollution Control District

The SJVAPCD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the SJVAB. The SJVAPCD jurisdiction includes all of Merced, San Joaquin, Stanislaus, Madera, Fresno, Kings, and Tulare Counties, and the San Joaquin Valley portion of Kern County.

The SJVAPCD has prepared several air quality attainment plans to achieve the O_3 and particulate matter standards, the most recent of which include the *2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan* (SJVAPCD 2014b), *2013 Plan for the Revoked 1-Hour Ozone Standard* (SJVAPCD 2013), *2007 PM_{10} Maintenance Plan and Request for Redesignation* (SJVAPCD 2007)*, 2012 $PM_{2.5}$ Plan* (SJVAPCD 2012), and *2015 Plan for the 1997 $PM_{2.5}$ Standard* (SJVAPCD 2015b). The following sections summarize key elements of these and other recent air quality attainment plans.

Ozone Attainment Plans

Extreme 1-Hour Ozone Attainment Demonstration Plan

The *Extreme 1-Hour Ozone Attainment Demonstration Plan*, adopted by the SJVAPCD Governing Board October 8, 2004, sets forth measures and emission-reduction strategies designed to attain the federal 1-hour O_3 standard by November 15, 2010, as well as an emissions inventory, outreach, and rate of progress demonstration. This plan was approved by the EPA on March 8, 2010; however, the EPA's approval was subsequently withdrawn effective November 26, 2012, in response to a decision issued by the U.S. Court of Appeals for the Ninth Circuit (*Sierra Club v. EPA*, 671 F.3d 955) remanding EPA's approval of these State Implementation Plan (SIP) revisions. Concurrent with the EPA's final rule, CARB withdrew the 2004 plan. The SJVAPCD developed a new plan for the 1-hour O_3 standard, the *2013 Plan for the Revoked 1-Hour Ozone Standard*, which it adopted in September 2013.

2007 8-Hour Ozone Plan

The *2007 8-Hour Ozone Plan*, adopted by the Governing Board on April 30, 2007, sets forth measures and a "dual path" strategy to attain the federal 1997 8-hour O_3 standard by 2023 for the SJVAB by reducing emissions of O_3 and particulate matter precursors (SJVAPCD 2007). The plan also includes provisions for improved pollution control technologies for mobile and stationary sources, as well as an increase in state and federal funding for incentive-based measures to

reduce emissions. Local measures would have been adopted by the SJVAPCD before 2012. This plan was approved by the EPA on April 30, 2012. On November 26, 2012, however, the EPA withdrew its determination that the plan satisfied the federal Clean Air Act requirements regarding emissions growth caused by growth in vehicle miles traveled. Other determinations in the EPA's March 1, 2012, rule approving the plan remain unchanged and in effect. The SJVAPCD is currently in the process of developing an O_3 plan to address EPA's 2008 8-hour O_3 standard, with attainment required by 2032.

2009 Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans

On April 16, 2009, the Governing Board adopted the *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans* (2009 RACT SIP) (SJVAPCD 2009b). In part, the 2009 RACT SIP satisfied the commitment by the SJVAPCD for a new reasonably available control technology analysis for the 1-hour O_3 plan (see discussion of the EPA withdrawal of approval in the *Extreme 1-Hour Ozone Attainment Demonstration Plan* summary above) and was intended to prevent all sanctions that could be imposed by EPA for failure to submit a required SIP revision for the 1-hour O_3 standard. With respect to the 8-hour standard, the plan also assesses the SJVAPCD's rules based on the adjusted major source definition of 10 tons per year (due to the SJVAB's designation as an extreme O_3 nonattainment area), evaluates SJVAPCD rules against new Control Techniques Guidelines promulgated since August 2006, and reviews additional rules and rule amendments that had been adopted by the Governing Board since August 17, 2006, for reasonably available control technology consistency.

2013 Plan for the Revoked 1-Hour Ozone Standard

The SJVAPCD developed a plan for EPA's revoked 1-hour O_3 standard after the EPA withdrew its approval of the 2004 *Extreme 1-Hour Ozone Attainment Demonstration Plan* as a result of litigation. As a result of the litigation, the EPA reinstated previously revoked requirements for 1-hour O_3 attainment plans. The 2013 plan addresses those requirements, including a demonstration of implementation of Reasonably Available Control Measures and a demonstration of a rate of progress averaging 3% annual reductions of ROG or NO_x emissions every 3 years. The *2013 Plan for the Revoked 1-Hour Ozone Standard* was approved by the Governing Board on September 19, 2013 (SJVAPCD 2013). Based on implementation of the ongoing control measures, preliminary modeling had indicated that the SJVAB would attain the 1-hour O_3 standard by 2017, before the final attainment year of 2022 and without relying on long-term measures under the federal Clean Air Act Section 182(e)(5) ("black box reductions"). While the EPA has revoked the 1-hour O_3 standard, the State of California continues to rely on the same numeric standard as the former federal 1-hour O_3 standard, and the SJVAB continues to be in nonattainment for that standard.

2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan

On June 19, 2014, the Governing Board adopted the *2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan* (SJVAPCD 2014b). This RACT SIP includes a demonstration that the SJVAPCD rules implement RACT. The plan reviews each of the NO_x reduction rules and concludes that they satisfy requirements for stringency, applicability, and enforceability, and meet or exceed RACT. The plan's analysis of further ROG reductions through modeling and technical analyses demonstrates that added ROG reductions will not advance SJVAB's O_3 attainment. Each ROG (i.e., ROG) rule evaluated in the 2009 RACT SIP, however, has been subsequently approved by the EPA as meeting RACT within the last 2 years. The O_3 attainment strategy, therefore, focuses on further NO_x reductions.

2016 Plan for the 8-Hour Ozone Standard

On June 16, 2016, the Governing Board approved the 2016 Plan for the 2008 8-Hour Ozone Standard. The comprehensive strategy in this plan includes a combination of regulatory actions; incentive programs; technology advancement programs; policy and legislative activities; and public outreach, education, and communication. The plan builds from the regulations adopted under previous District attainment plans for ozone and $PM_{2.5}$ and is projected to reduce NO_X emissions by over 60% to bring the SJVAB into attainment of EPA's 2008 8-hour ozone standard no later than December 31, 2031

Particulate Matter Attainment Plans

2007 PM_{10} Maintenance Plan and Request for Redesignation

On September 20, 2007, the Governing Board approved the *2007 PM_{10} Maintenance Plan and Request for Redesignation* (SJVAPCD 2007). After achieving compliance with the annual and 24-hour NAAQS for PM_{10} during the period from 2003 to 2006,[3] the SJVAPCD prepared the *2007 PM_{10} Maintenance Plan and Request for Redesignation*. The plan includes future emission estimates through 2020 and, based on modeling, projects that SJVAB will continue to attain the PM_{10} NAAQS through 2020. The plan does not call for adoption of new control measures. Measures called for in the *2007 8-Hour Ozone Plan* and *2008 $PM_{2.5}$ Plan* (discussed subsequently) will also produce PM_{10} benefits; however, the plan does include a contingency plan if future PM_{10} levels were to exceed the NAAQS. It also includes a request that the EPA redesignate the SJVAB to attainment status for the PM_{10} NAAQS. On October 25, 2007, CARB approved the SJVAPCD's plan with modifications to the transportation conformity budgets. On

[3] Attainment is achieved if the 3-year annual average PM_{10} concentration is less than or equal to 50 $\mu g/m^3$ and the expected 24-hour exceedance days is less than or equal to 1.0.

September 25, 2008, the EPA redesignated the SJVAB to attainment for the PM_{10} NAAQS and approved the PM_{10} maintenance plan.

2008 $PM_{2.5}$ Plan

The SJVAPCD Governing Board adopted the *2008 $PM_{2.5}$ Plan* on April 30, 2008 (SJVAPCD 2008). This plan is designed to assist the SJVAB in attaining $PM_{2.5}$ standards, including the 1997 federal standards, 2006 federal standards, and state standard, as soon as possible. On July 13, 2011, the EPA issued a proposed rule partially approving and disapproving the *2008 $PM_{2.5}$ Plan*. Subsequently, on November 9, 2011, the EPA issued a final rule approving most of the plan with an effective date of January 9, 2012. However, the EPA disapproved the plan's contingency measures because they would not provide sufficient emission reductions.

2012 $PM_{2.5}$ Plan

Approved by the Governing Board on December 20, 2012, the *2012 $PM_{2.5}$ Plan* addresses attainment of EPA's 24-hour $PM_{2.5}$ standard of 35 micrograms (µg) per cubic meter (m^3), established in 2006. In addition to reducing direct emissions of $PM_{2.5}$, this plan focuses on reducing emissions of NO_x, which is a predominant pollutant in the formation of $PM_{2.5}$ in the SJVAB. The plan relies on a multilevel approach to reducing emissions through SJVAPCD efforts (industry, the general public, employers, and small businesses) and state/federal efforts (passenger vehicles, heavy-duty trucks, and off-road sources), as well as SJVAPCD and state/federal incentive programs to accelerate replacement of on-road and off-road vehicles and equipment. Through compliance with this attainment plan, the SJVAB would achieve attainment of the federal $PM_{2.5}$ standard by the attainment deadline of 2019, with the majority of the SJVAB actually experiencing attainment well before the deadline. The EPA lowered the $PM_{2.5}$ standard again in 2012 and is in the process of completing attainment designations.

2015 Plan for the 1997 $PM_{2.5}$ Standard

The Governing Board adopted the *2015 Plan for the 1997 $PM_{2.5}$ Standard* on April 16, 2015 (SJVAPCD 2015b). This plan addresses the EPA's annual $PM_{2.5}$ standard of 15 µg per m^3 and 24-hour $PM_{2.5}$ standard of 65 µg/m^3 established in 1997. While nearly achieving the 1997 standards, the SJVAB experienced higher $PM_{2.5}$ levels in winter 2013–2014 due to the extreme drought, stagnation, strong inversions, and historically dry conditions; thus, the SJVAPCD was unable to meet the attainment date of December 31, 2015. Accordingly, this plan also contains a request for a one-time extension of the attainment deadline for the 24-hour standard to 2018 and the annual standard to 2020. The plan builds on past development and implementation of effective control strategies. Consistent with EPA regulations for $PM_{2.5}$ plans to achieve the 1997 standards, the plan contains most stringent measures, best available control measures, and additional

enforceable commitments for further reductions in emissions and ensures expeditious attainment of the 1997 standard.

Applicable Rules

Because Project construction and non-vehicular operational activities would be located within SJVAB and fall within the jurisdiction of the SJVAPCD, only SJVAPCD regulations are discussed in this section.

The SJVAPCD's primary means of implementing air quality plans is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by the SJVAPCD's permit authority and through its review and planning activities. Unlike stationary source projects, which encompass very specific types of equipment, process parameters, throughputs, and controls, air emissions sources from land use development projects are mainly mobile sources (traffic) and area sources (small dispersed stationary and other non-mobile sources), including exempt (i.e., no permit required) sources such as consumer products, landscaping equipment, furnaces, and water heaters. Mixed-use land development projects may include nonexempt sources, including devices such as small to large boilers, stationary internal combustion engines, gas stations, or asphalt batch plants.

Notwithstanding nonexempt stationary sources, which would be permitted on a case-by-case basis, SJVAPCD regulations VIII and IX generally apply to land use development projects and are described as follows:

Regulation IV – Prohibitions

- Rule 4101 – Visible Emissions
- Rule 4102 – Nuisance
- Rule 4601 – Architectural Coatings
- Rule 4902 Residential Water Heaters

Regulation VIII – Fugitive PM_{10} Prohibition

- Rule 8021 Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities
- Rule 8031 Bulk Materials
- Rule 8041 Carryout and Trackout
- Rule 8051 Open Areas
- Rule 8061 Paved And Unpaved Roads

- Rule 8071 Unpaved Vehicle/Equipment Traffic Areas

Pursuant to Rule 8021 Section 6.3, the Project would be required to develop, prepare, submit, obtain approval of and implement a Dust Control Plan.

Regulation IX – Mobile and Indirect Sources

- Rule 9110 General Conformity
- Rule 9120 Transportation Conformity
- Rule 9410 Employer Based Trip Reduction
- Rule 9510 Indirect Source Review (ISR)

Rule 9510 (Indirect Source Review)

The ISR rule, which was adopted December 15, 2005, and went into effect March 1, 2006, requires developers of new residential, commercial, and some industrial projects to reduce NO_x and PM_{10} emissions generated by their projects. Pursuant to Rule 9510, the purpose of the ISR program is to reduce emissions of NO_x and PM_{10} from new land development projects. In general, development contributes to air pollution in the SJVAB increasing the number of vehicles and vehicle miles traveled. ISR applies to development projects that require discretionary approval from the lead agency. The ISR rule also applies to transportation and transit projects whose construction exhaust emissions would equal or exceed 2 tons per year of NO_x or PM_{10}. The ISR rule requires submittal of an Air Impact Assessment application no later than the date on which application is made for a final discretionary approval from the public agency. The Air Impact Assessment contains the information necessary to calculate both construction and operational emissions of a development Project.

Section 6.0 of the ISR rule outlines general mitigation requirements for developments that include reduction in construction emissions of 20% of the total construction NO_x emissions, and 45% of the total construction PM_{10} exhaust emissions. The rule also requires the project to reduce operational NO_x emissions by 33.3% and operational PM_{10} emissions by 50%, as compared to the unmitigated baseline. Section 7.0 of the ISR rule includes fee schedules for construction or operational excess emissions of NO_x or PM_{10}—those emissions above the goals identified in Section 6.0 of the rule. Monies collected from this fee are used by the SJVAPCD to fund emission reduction projects in the SJVAB on behalf of the project.

Rule 9610 State Implementation Plan Credit for Emission Reductions Generated through Incentive Programs

Rule 9610 provides an administrative mechanism for the SJVAPCD to receive credit towards SIP requirements for emission reductions achieved in the SJVAB through incentive programs

administered by the SJVAPCD, United States Department of Agriculture Natural Resources Conservation Service, or CARB. On April 9, 2015, EPA finalized a limited approval and limited disapproval (for a minor administrative error) of Rule 9610 as a revision to the California SIP. Additional documentation regarding the effectiveness of the SJVAPCD's incentive programs can be found in *2015 Annual Demonstration Report SIP Credit for Emission Reductions Generated Through Incentive Programs* (SJVAPCD 2015c).

Merced County Association of Governments

The Merced County Association of Governments (MCAG) is the regional planning agency for Merced County and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. MCAG serves as the federally designated metropolitan planning organization (MPO) for Merced County. With respect to air quality planning and other regional issues, MCAG has prepared the *2018 Regional Transportation Plan and Sustainable Communities Strategy* (2018 RTP/SCS) for the region (MCAG 2018). The 2018 RTP/SCS is a problem-solving guidance document that directly responds to what MCAG has learned about Merced County's challenges through the annual State of the Region report card.

In regards to air quality, the 2018 RTP/SCS sets the policy context in which MCAG participates in and responds to the air districts air quality plans and builds off the air districts air quality plans processes that are designed to meet health-based criteria pollutant standards in several ways (MCAG 2018). First, it complements air quality plans by providing guidance and incentives for public agencies to consider best practices that support the technology-based control measures in air quality plans. Second, the 2018 RTP/SCS emphasizes the need for local initiatives that can reduce the region's GHG emissions that contribute to climate change, an issue that is largely outside the focus of local attainment plans, which is assessed in Section 8. Third, the 2018 RTP/SCS emphasizes the need for better coordination of land use and transportation planning, which heavily influences the emissions inventory from the transportation sectors of the economy. This also minimizes land use conflicts, such as residential development near freeways, industrial areas, or other sources of air pollution.

City of Merced General Plan

The project site is currently within the boundaries of Merced County and within the City of Merced Sphere of Influence. The project proposes to annex the site to the City. Thus, only City of Merced General Plan policies are discussed in this section.

The City of Merced General Plan 2030 (General Plan) includes the following policy and strategies to limit air pollution (City of Merced 2012):

Policy SD-1.1 Accurately determine and fairly mitigate the local and regional air quality impacts of Projects proposed in the City of Merced.

Implementing Actions

1.1.a Implement uniform standards, analysis methods and significance thresholds recommended by the SJVAPCD for mitigating air quality impacts resulting from development.

1.1.b Ensure that significant air quality impacts identified during CEQA review are consistently and fairly mitigated.

1.1.c All air quality mitigation measures should be feasible, implementable, and cost effective.

1.1.d Work with the SJVAPCD to identify regional cumulative transportation and air quality impacts

1.1e Reduce the air quality impacts of development projects that may be insignificant by themselves, but cumulatively are significant.

1.1f Encourage innovative measures to reduce air quality impacts by coordination with the SJVAPCD, project applicants and other interested parties

Policy SD-1.2 Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.

Implementing Actions

1.2.b Consult with the SJVACPD during CEQA review for discretionary projects.

1.2e In cooperation with the SVAPCD, examine potential sources of revenue to pay for air quality improvement measures.

Policy SD-1.3 Integrate land use, transportation and air quality planning for the most efficient use of public resources and for a healthier environment.

Implementing Actions

1.3.a The city of Merced will consider air quality when planning the land uses and transportation systems to accommodate the expected growth in this community.

1.3b Transportation improvement should be consistent with the air quality goals and policies of the General Plan.

1.3.d Encourage construction of low income housing developments that use transit-oriented and pedestrian-oriented design principles.

1.3.f Provide for installation and maintenance of additional landscaping which helps maintain and improve air quality, by continuing to increase the extent of landscaped areas in the City using street trees, parking lot shading, median islands and landscape buffers.

Policy SD-1.5 Provide Public Facilities and Operations that can serve as a model for the Private Sector in Implementation of Air Quality Programs.

Implementing Actions

1.5.a Continue to support, encourage, and implement to the extent feasible innovative employer based trip reduction programs for their employees.

Policy SD-1.6 To reduce emissions of PM_{10}, $PM_{2.5}$ and other particulates with local control potential

Implementing Actions

1.6.a Work with the SJVAPCD to reduce to the maximum extent feasible particulate emissions from construction, grading and demolition

1.6.c Require all access roads, driveways, and parking areas in new commercial and industrial development to be paved or constructed of other materials that minimize particulate emissions.

3.3.4 Impacts

Methods of Analysis

Construction

Emissions from the construction phase of the proposed project were estimated using CalEEMod Version 2016.3.2 (CAPCOA 2017). Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by the project applicant and CalEEMod default values when project specifics were not known.

The proposed project would develop 540 residential units in twenty 3-story buildings with a 13,700 square foot supporting clubhouse building, a mixed use building with 66,000 square feet of ground floor retail and 30 additional residential units on the second floor. The project would also include 1,223 parking spaces. For the purposes of modeling, it was assumed that construction of the proposed project would commence in January 2021[4] and would last approximately 27 months,

[4] The analysis assumes a construction start date of January 2021, which represented the earliest date construction would initiate at the time that the modeling was conducted. Assuming the earliest start

ending in March 2023. The analysis contained herein is based on the following subset area schedule assumptions (duration of phases is approximate)

- Demolition – 1.5 months (January 2021 – February 2021)
- Site Preparation – 1 month (February – March 2021)
- Grading – 2 months (March 2021 – May 2021)
- Building Construction – 20 months (June 2021 – January 2023)
- Architectural Coating 1 – 1.5 months (December – January 2021)
- Architectural Coating 2 – 1.5 months (July 2022 – August 2021)
- Paving – 1.5 months (February 2023 – March 2023)
- Architectural Coating – 1.5 months (March 2023 – May 2023)

The estimated construction duration provided was based on CalEEMod defaults. Detailed construction equipment modeling assumptions are provided in Appendix D, CalEEMod Outputs. Construction-worker and vendor trip estimates by construction phase were based on CalEEMod default data. CalEEMod default trip length values were used for the distances for all construction-related trips. The construction equipment mix used for estimating the construction emissions of the proposed project is based on information provided by the project applicant and is shown in Table 3.3-4, Construction Scenario Assumptions.

Table 3.3-4
Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Site Preparation	8	0	0	Graders	1	8
				Scrapers	1	8
				Tractors/Loaders/ Backhoes	1	8

date for construction represents the worst-case scenario for criteria air pollutant emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years. Thus, the fact that construction would occur later than the dates used for modeling does not invalidate the modeling results. Impacts would be the same or less than those identified herein.

Table 3.3-4
Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Grading	14	0	110	Rubber-Tired Dozers	1	8
				Graders	1	8
				Crawler Tractors	1	8
				Tractors/Loaders/ Backhoes	2	7
Building Construction	50	20	0	Cranes	1	8
				Forklifts	2	7
				Generator Sets	1	8
				Tractors/Loaders/ Backhoes	1	6
				Welders	3	8
Trenching	14	0	0	Excavators	2	8
				Tractors/Loaders/ Backhoes	2	8
				Trenchers	1	8
Paving	14	0	0	Pavers	1	8
				Paving Equipment	1	8
				Tractors/Loaders/ Backhoes	1	8
				Rollers	2	8
Architectural Coating	14	0	0	Air Compressors	1	6

Source: Appendix D

For the analysis, it was assumed that heavy construction equipment would be operating five days per week (22 days per month) during construction. Construction worker and vendor trips were based on CalEEMod default assumptions and rounded up to the nearest whole number to account for whole round trips.

Operation

Emissions from the operational phase of the proposed project were estimated using CalEEMod. Operational year 2024 was assumed as it would be the earliest potential first full year of operation following completion of construction.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating and water heating are calculated in the building energy use module of CalEEMod, as described in the following text.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2017). Consumer product VOC emissions for the buildings are estimated in CalEEMod based on the floor area of buildings and on the default factor of pounds of VOC per building square foot per day. Consumer products associated with the parking lot and other asphalt surfaces include degreasers, which were estimated based on the square footage of the parking lot and the default factor of pounds of VOC per square foot per day. The CalEEMod default values for consumer products were assumed.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings, such as in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from the application of surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emissions factor is based on the VOC content of the surface coatings, and SJVACPD Rule 4601 (Architectural Coatings) governs the VOC content for interior and exterior coatings. This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories. The proposed project would use architectural coatings that would not exceed 100 grams per liter for interior applications and 150 grams per liter for exterior applications consistent with SJVACDP RULE 4601. The model default reapplication rate of 10 percent of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the surface area for painting equals 2.7 times the floor square footage, with 75 percent assumed for interior coating and 25 percent assumed for exterior surface coating (CAPCOA 2017).

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

Mobile Sources

Following the completion of construction activities, the proposed project would generate criteria pollutant emissions from mobile sources (vehicular traffic) as a result of the residents and patrons at the commercial uses of the proposed project. The maximum weekday trip rates were taken from the Traffic Impact Study for University Village (Appendix M). The weekend trip rates were adjusted based on CalEEMod default trip rates. CalEEMod default data, including trip characteristics and emissions factors, were used for the model inputs. Project-related traffic was assumed to include a mixture of vehicles in accordance with the associated use, as modeled within the CalEEMod. Emission factors representing the vehicle mix and emissions for 2024 were used to estimate emissions associated with vehicular sources.

Thresholds of Significance

The significance criteria used to evaluate the project impacts to air quality is based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this air quality analysis, a significant impact would occur if the project would (14 CCR 15000 et seq.):

- Conflict with or obstruct implementation of the applicable air quality plan.
- 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.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or pollution control district may be relied upon to determine whether the project would have a significant impact on air quality.

San Joaquin Valley Air Pollution Control District

Table 3.3-5, San Joaquin Valley Air Pollution Control District Significance Thresholds for Criteria Pollutants, presents the emissions-based thresholds developed in the SJVAPCD *GAMAQI* (SJVAPCD 2015a). These include significance thresholds for construction emissions and operational permitted and non-permitted equipment and activities. The GAMAQI recommends evaluating impact significance for these categories separately. These thresholds of significance are based on a calendar-year basis, although construction emissions are assessed on a rolling 12-month period.

Table 3.3-5
San Joaquin Valley Air Pollution Control District Significance Thresholds for Criteria Pollutants

Pollutant	Construction Emissions (tons per year)	Operational Emissions (tons per year)	
		Permitted Equipment and Activities	*Non-Permitted Equipment and Activities*
ROG	10	10	10
NO_x	10	10	10
CO	100	100	100
SO_x	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15

Source: SJVAPCD 2015a

In addition to the annual emissions mass thresholds described in Table 3.3-5, the SJVAPCD has also established screening criteria to determine whether a project would result in a CO hotspot at affected roadway intersections (SJVAPCD 2015a). If neither of the following criteria are met at any of the intersections affected by the project, the project would result in no potential to create a violation of the CO standard:

- A traffic study for the project indicates that the LOS on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F.
- A traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity.

Toxic Air Contaminants

The SJVAPCD has established thresholds of significance for combined TAC emissions from the operations of both permitted and non-permitted sources (SJVAPCD 2015a). Projects that have

the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the maximally exposed individual equals or exceeds 20 in 1 million people.[5]
- Hazard Index[6] for acute and chronic noncarcinogenic TACs equals or exceeds 1 for the maximally exposed individual.

Odors

As described in the GAMAQI, due to the subjective nature of odor impacts, there are no quantitative thresholds to determine if potential odors would have a significant impact (SJVAPCD 2015a). Projects must be assessed for odor impacts on a case-by-case basis for the following two situations:

- **Generators:** Projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate.
- **Receivers:** Residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.

Table 3.3-6, Screening Distances for Potential Odor Sources, presents the common types of facilities that have been known to produce substantial odors, as well as screening distances between these odor sources and receptors, as identified in the GAMAQI.

Table 3.3-6
Screening Distances for Potential Odor Sources

Type of Facility	Screening Distance (miles)
Wastewater treatment facility	2
Sanitary landfill	1
Transfer station	1
Composting facility	1
Petroleum facility	2
Asphalt batch plant	1
Chemical manufacturing	1

[5] The cancer risk threshold was increased from 10 to 20 in 1 million with approval of APR 1906 (Framework for Performing Health Risk Assessments) on June 30, 2015.

[6] Non-cancer adverse health impact, both for acute (short-term) and chronic (long-term) health effects, is measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentration from the project to a published reference exposure level that could cause adverse health effects as established by the Office of Environmental Health Hazard Assessment. The ratio (referred to as the hazard quotient) of each noncarcinogenic substance that affects a certain organ system is added together to produce an overall hazard index for that organ system.

Table 3.3-6
Screening Distances for Potential Odor Sources

Type of Facility	Screening Distance (miles)
Fiberglass manufacturing	1
Painting/coating (i.e., auto body shop)	1
Food processing facility	1
Feed lot / dairy	1
Rendering plant	1

Source: SJVAPCD 2015a

If the project would result in an odor source and sensitive receptors being located within these screening distances, additional analysis would be required. For projects involving new receptors locating near an existing odor source where there is currently no nearby development and for new odor sources locating near existing receptors, the SJVAPCD recommends the analysis be based on a review of odor complaints for similar facilities, with consideration also given to local meteorological conditions, particularly the intensity and direction of prevailing winds. Regarding the complaint record of the odor source facility (or similar facility), the facility would be considered to result in significant odors if there has been:

- More than one confirmed complaint per year averaged over a 3-year period, or
- Three unconfirmed complaints[7] per year averaged over a 3-year period.

Impacts and Mitigation Measures

Impact 3.3-1: Implementation of the proposed project would not conflict with or obstruct the implementation of applicable air quality plans. This impact would be less-than-significant impact.

The Crossings and Remainder Area

A project is non-conforming with an air quality plan if it conflicts with or delays implementation of any applicable attainment or maintenance plan. A project is conforming if it complies with all applicable SJVAPCD rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). Zoning changes, specific plans, general plan amendments and similar land use plan changes which do not increase dwelling unit

[7] An unconfirmed complaint means that either the odor/air contaminant release could not be detected or the source/facility cannot be determined (SJVAPCD 2015a).

density, do not increase vehicle trips, and do not increase vehicle miles traveled are also deemed to comply with the applicable air quality plan (SJVAPCD 2015a).

The project would comply with applicable SJVAPCD rules and regulations, such as Regulation VIII (Fugitive PM_{10} Prohibitions) and IX (Mobile and Indirect Sources), as discussed in Impact 3.3-2. The project site is currently designated as Rural Residential Center in the Merced County City Planning Area-Merced land use map (Merced County 2011). The project site is located within the City's Sphere of Influence and designated Rural Residential in the City's *Merced Vision 2030 General Plan*. The current County land use designation for the project site is Agricultural-Residential (A-R) and the zoning for the project site is Rural Residential (R-R), which provides areas for rural residential development. The proposed project includes a request to change the General Plan land use designation from the County's RR to City of Merced Neighborhood Commercial (CN) and High-Medium Density Residential (HMD). The project proposes to rezone The Crossings portion of the site to Planned Development and to pre-zone the Remainder Area, with approximately 19.4 acres of Urban Transition (U-T) and approximately 20.8 acres of Low Density Residential (R-1-10). No new development within the Remainder Area is proposed at this time, however the portion of the Remainder Area that is proposed to be zoned R-1-10 could support single-family residential lots with a minimum size of 10,000 square feet. The portion of the Remainder Area zoned U-T would only allow new agricultural development unless further rezoning is approved, and thus the proposed project would not result in the potential for new residential units on that portion of the site. The proposed change in the land use designation for the project site requires an analysis of the project's anticipated population growth compared to the MCAG's growth forecasts in their 2018 RTP/SCS, which are presented in Table 3.3-7, Projected Population and Employment in Merced County.

Table 3.3-7
Projected Population and Employment in Merced County

Metric	Jurisdiction	2010	2015	2020	2025	2030	2040
Population	Merced County	256,800	272,718	291,056	310,572	334,443	388,939
	City of Merced	77,080	84,125	89,719	95,670	102,952	116,864
Households	Merced County	--	81,457	88,526	94,950	102,791	117,648
	City of Merced	--	26,790	29,090	31,178	33,729	38,561
Employment	Merced County	--	72,864	82,017	85,055	92,099	103,290
	City of Merced	--	26,693	32,720	35,049	37,817	43,927

Source: MCAG 2018

U.S. Census data provides an estimate County's population in 2020 of 277,680 persons (U.S. Census 2020). This is below the MCAG 2018 RTP/SCS 2020 population forecast of 291,056 persons. Since the MCAG 2018 RTP/SCS did not have a projection for 2024 (project buildout), 2025 data was used because it is the closest available year with applicable data. The 2025 forecast projects the County's population to be 310,572 in 2025, or 23,641 greater than the 2019 population per census data. This reflects an increase of 3,941 people per year between 2019 and 2025. Per the Census data, there were an average of 3.32 persons per household in Merced County between 2015 and 2019 (U.S. Census 2020). The project would add 552 dwelling units with The Crossings component of the project (not including the 18 extended stay units which are not intended as permanent housing). It is estimated that the project could accommodate between 1,123 and 1,834 residents, based on household size data in the City's Public Facility Impact Fees program for the lower end of this range and the City's average household size as estimated by the California Department of Finance (DOF) (DOF 2021). While no development is proposed within the Remainder Area at this time, additional residential development would be possible under the proposed General Plan and zoning designations. If all of the approximately 20.8-acre eastern portion of the Remainder Area that is proposed to be zoned R-1-10 were redeveloped, it could support up to 90 dwelling units. There are four existing homes in that portion of the site, thus the project could accommodate a net increase of 86 dwelling units, which would accommodate an additional 286 residents. If new residential development were to occur only on vacant land within this portion of the Remainder Area, it could support approximately 29 new single-family residences, generating a new population within the City of 93 people.

In total, the proposed project could accommodate a maximum new population of up to 2,120 people. This is substantially below the projected population growth for the County of 23,641 additional people in 2025 (MCAG 2018) and the proposed project would not result in an increase in the forecast population growth. Therefore, the project would be consistent with the 2018 RTP/SCS and the population growth assumptions in the Attainment Plans.

Emissions from criteria pollutants during construction would not exceed the SJVAPCD significance thresholds as discussed in Impact 3.3-2. During the long-term operational phase, the project would result in a net increase in emissions although, as discussed in Impact 3.3-2, the increase in emissions would not exceed any significance threshold or violate any SJVAPCD rule or regulation.

In summary the project would not exceed the growth forecast in MCAG's 2018 RTP/SCS and air pollutant emissions resulting from construction and operation of the project would not exceed SJVAPCD thresholds. Therefore, the project would not conflict with the SJVAPCD's air quality plans and impact would be **less than significant.**

Mitigation Measures

No mitigation measures are required.

Impact 3.3-2: Implementation of the proposed project would increase the emissions of criteria pollutants in the SJVAB, which is non-attainment under the NAAQS and CAAQS, but would not exceed SJVAPCD significance thresholds and would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment. This would be a less-than-significant impact.

The Crossings

Construction Emissions

Construction of the project would result in the temporary addition of pollutants caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and ROG off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated with a corresponding uncertainty in precise ambient air quality impacts.

Criteria air pollutant emissions associated with construction activity were quantified using CalEEMod. Default values provided by the program were used where detailed proposed 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 included in the Methods of Analysis sub-section above. The information contained in Appendix D was used as CalEEMod inputs.

Implementation of the project would generate air pollutant emissions from entrained dust, off-road equipment, and vehicle emissions. 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. Table 3.3-8 presents the estimated maximum annual construction emissions generated during construction of the project. Details of the emission calculations are provided in Appendix A.

Table 3.3-8
Estimated Maximum Annual Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per year					
2021	1.23	4.80	4.21	0.01	1.05	0.48
2022	3.45	4.37	4.68	0.02	0.95	0.34
2023	1.82	0.51	0.69	<0.01	0.11	0.04
Total Annual Emissions[1]						
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	No	No	No	No	No	No

Source: Appendix D
Acronyms and Note: CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_x = sulfur oxides; ROG = reactive organic gases
[1] Total emissions reflect a rolling twelve month total.

Maximum annual emissions of ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions would occur during construction in 2022 as a result of off-road equipment operation and on-road vendor trucks. As shown in Table 3.3-8, annual construction emissions would not exceed the SJVAPCD annual significance thresholds for ROG NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction. Therefore, construction emissions for the project would be **less than significant.**

The project would comply with SJVAPCD Rule 8021 to control fugitive dust emissions generated during grading activities, which would be required as a condition of approval. Standard construction practices that would be employed to reduce fugitive dust emissions include:

- Develop a dust control plan to outline how the project will comply with Rule 8021 and minimize fugitive dust during construction,
- Minimize and cleanup trackout onto paved roads,
- Cover haul trucks,
- Rapid cleanup of project-related trackout or spills on paved roads,
- Minimize grading and soil movement when winds exceed 30 miles per hour, and
- Implement a speed limit of 15 miles per hour during all construction phases for vehicles travelling on un-paved roads.
- Construction Ambient Air Quality Impact Assessment

As recommended by the GAMAQI (SJVAPCD 2015a), an ambient air quality impacts assessment is not required for this project because construction would not generate on-site emissions of more than 100 pound per day for any pollutant, as shown in Table 3.3-9, Estimated Maximum Daily On-

site Construction Criteria Air Pollutant Emissions. Summary tables of annual and daily emissions associated with construction are included in Appendix D.

Table 3.3-9
Estimated Maximum Daily On-site Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per day					
2021	93.41	46.45	44.99	0.14	10.32	6.39
2022	92.91	34.56	42.49	0.14	8.37	2.91
2023	88.06	27.92	34.91	0.12	7.08	2.40
SJVAPCD Threshold	*100*	*100*	*100*	*100*	*100*	*100*
Threshold Exceeded?	No	No	No	No	No	No

Source: Appendix D
Acronyms: CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_x = sulfur oxides; ROG = reactive organic gases

Operational Emissions

The project involves development of a mixed use commercial and residential project with 552 residential apartments, 18 extended-stay suites, and 66,000 square feet of commercial space. SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources (vehicle trips), area sources (consumer products, landscape maintenance equipment), and energy sources. Although the extended-stay units are not intended to function as permanent housing, they are considered residential units for the purposes of the air pollution emissions modeling. As discussed in Methods of Analysis under Operation, pollutant emissions associated with long-term operations were quantified using CalEEMod. Project-generated mobile source emissions were estimated based on project-specific trip rates.

Table 3.3-10 presents the maximum annual area, energy, and mobile source emissions associated with operation (Year 2024) of the project and demonstrates that the combined annual area, energy, and mobile source emissions would not exceed the SJVAPCD operational thresholds for ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$.

The values shown are the annual emissions from the operation of the project. Details of the emission calculations are provided in Appendix D.

Table 3.3-10
Estimated Annual Operational Criteria Air Pollutant Emissions

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	5.67	0.29	6.38	<0.01	0.32	0.32
Energy	0.05	0.42	0.20	<0.01	0.03	0.03
Mobile	2.79	4.61	24.30	0.06	532	1.46
Total Annual Emissions	**8.51**	**5.32**	**30.88**	**0.06**	**5.67**	**1.81**
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	No	No	No	No	No	No

Source: Appendix D

Acronyms: PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO_x = sulfur oxides; ROG = reactive organic gases

For purposes of this air quality analysis and consistent with SJVAPCD guidance documents, actions that exceed criteria pollutant NAAQS (i.e., primary standards designed to safeguard the health of people considered to be sensitive receptors while outdoors and secondary standards designed to safeguard human welfare) or the EPA's Prevention of Significant Deterioration (PSD) Significant Impact Levels would result in significant impacts. Additionally, actions that violate CAAQS developed by CARB are considered significant.

Determination of whether project emissions would violate any ambient air quality standard is largely a function of air quality dispersion modeling. The SJVAPCD recommends that an ambient air quality analysis be performed when emissions of any criteria pollutant would equal or exceed any applicable threshold of significance for criteria pollutants or 100 lbs/day of any criteria pollutant. If the impacts resulting from a project's emissions would not exceed the CAAQS and NAAQS at the project's property boundaries, the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation (SJVAPCD 2015a). The CAAQS and NAAQS are shown in Table 3.3-3. The CalEEmod modeling shows that project construction is not expected to generate air pollutant emissions that exceed 100 lbs/day; therefore, an air quality dispersion modeling assessment is not required and the AAQS would not be exceeded as a result of project construction.

The SJVAB is a nonattainment area for O_3 and $PM_{2.5}$ under the NAAQS and/or CAAQS and nonattainment for PM_{10} under CAAQS. The poor air quality in the SJVAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., ROG and NO_x for O_3) potentially contribute to poor air quality. However, because the annual construction emissions associated with the project would not exceed the SJVAPCD significance thresholds for criteria pollutants, the project would result in a **less-than-significant** increase in

emissions of nonattainment criteria pollutants, and thus the construction emissions would not be cumulatively considerable. Furthermore, the project would not conflict with the SJVAPCD Ozone Attainment Plans, or the PM_{10} or $PM_{2.5}$ Attainment Plan, which address the cumulative emissions in the SJVAB and account for emissions associated with construction activity in the SJVAB. Based on these considerations, the project would not result in a cumulatively considerable increase in emissions of nonattainment criteria pollutants. Impacts would be **less than significant.**

Remainder Area

While no development is proposed within the Remainder Area at this time, under the proposed General Plan and zoning designations, the eastern portion of the Remainder Area could support development of up to 90 dwelling units. The northwest corner of the site and a portion of the eastern side of the project site would be zoned Urban Transition, which allows development of agricultural uses but does not allow development of new residential, commercial, or industrial uses. Thus, no additional construction is expected to occur on those portions of the project site without further changes in the zoning designations. Development of up to 90 dwelling units within the eastern-most portion of the Remainder Area would generate air pollutant emissions during construction and operation. These emissions are expected to be substantially less than those of The Crossings component of the project because the future development would be approximately 16% of the residential uses included in The Crossings. Thus, it is expected that future development within the Remainder Area would result in **less-than-significant** emissions of nonattainment criteria pollutants during construction and operation and would not conflict with the SJVAPCD Ozone Attainment Plans, or the PM_{10} or $PM_{2.5}$ Attainment Plan. Based on these considerations, the project would not result in a cumulatively considerable increase in emissions of nonattainment criteria pollutants. Impacts would be **less than significant.**

Mitigation Measures

No mitigation measures are required.

Impact 3.3-3: Implementation of the proposed project may expose sensitive receptors to pollutants including criteria air pollutants and TACs. For most pollutants and TACs the project would not create a substantial concentration of pollutants and impacts would remain less than significant. However, potential exposure to the *Coccidioides immitis* fungus would result in a potentially significant impact.

The Crossings and Remainder Area

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 persons termed "sensitive receptors" are the most serious hazards of existing air quality conditions in the area. 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, as identified by CARB, include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases; however, for the purposes of this analysis, residents are also considered sensitive receptors. As such, sensitive receptors include residences, schools, playgrounds, child-care centers, athletic facilities, long-term health-care facilities, rehabilitation centers, convalescent centers, and retirement homes. The closest off-site sensitive receptors to the project are residential land uses located approximately 30 feet north of the project site boundary.

Valley Fever Exposure

As previously discussed in Regulatory Section, the proposed project would comply with SJVAPCD Rule 8021, which requires applicants to develop, prepare, submit, obtain approval of, and implement a Dust Control Plan. The Dust Control Plan would reduce fugitive dust impacts to less than significant for all construction phases of the project and would also limit the release of the *Coccidioides immitis (C. immitis)* fungus from construction activities. However, the Dust Control Plan would not be sufficient to avoid potential release of *C. immitis,* and the impact would be **potentially significant.** Mitigation Measure 3.3a would be required to be implemented during all construction phases of the project, including any future development within the Remainder Area, to reduce this impact to a less-than-significant level.

Health Impacts of Toxic Air Contaminants

In addition to impacts from exposure to substantial pollutant concentrations, certain projects may include emissions of pollutants identified by the state and federal government as TACs or HAPs. State law has established the framework for California's TAC identification and control project, which is generally more stringent than the federal project, and is aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal HAPs, and is adopting appropriate control measures for sources of these TACs.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The SJVAPCD recommends a carcinogenic (cancer) risk threshold of 20 in a million. The cancer burden is determined for the population located within the zone of impact, defined as the area within the one in one million cancer risk isopleth for a 70-year exposure. The furthest sensitive receptor from the project site was used as the basis for the radius of the zone of impact to determine cancer burden. In addition, some TACs have non-carcinogenic effects. The SJVAPCD

recommends a HIC significance threshold of 1.0 (project increment) and an acute hazard index (HIA) of 1.0. The exhaust from diesel engines is a complex mixture of gases, vapors, and particles, many of which are known human carcinogens. DPM has established cancer risk factors and relative exposure values for long term chronic health hazard impacts. No short term, acute relative exposure values are established and regulated and are therefore not addressed in this assessment.

Construction of project components would require use of heavy-duty construction equipment, which is subject to a CARB Airborne Toxics Control Measure for in-use diesel construction equipment to reduce diesel particulate emissions, and would involve use of diesel trucks, which are also subject to an Airborne Toxics Control Measure. According to the SJVAPCD, health risk assessments (which determine the exposure of sensitive receptors to toxic emissions) should be based on a 70-year exposure period for the maximally exposed individual resident. However, such assessments should also be limited to the period/duration of activities associated with the project. The duration of the proposed construction activities would constitute a small percentage of the total 30-year exposure period. The construction period for project would be approximately 28 months, after which construction-related TAC emissions would cease. Due to this relatively short period of exposure and minimal particulate emissions on site, TACs generated during construction would not be expected to result in concentrations causing significant health risks.

After construction is completed, there would be no long-term source of TAC emissions during operation. No residual TAC emissions and corresponding cancer risk are anticipated after construction, and no long-term sources of TAC emissions are anticipated during operation of the project. Implementation of the project would not expose sensitive receptors to substantial TAC concentrations and impacts would be less than significant.

For the reasons described above, the project would not result in substantial TAC exposure to sensitive receptors in the vicinity of the proposed project, and impacts would be **less than significant**.

Health Impacts of Carbon Monoxide

As described previously, exposure to high concentrations of CO can result in dizziness, fatigue, chest pain, headaches, and impairment of central nervous system functions. Mobile-source impacts, including those related to CO, occur essentially on two scales of motion. Regionally, project-related construction travel would add to regional trip generation and increase the vehicles miles traveled (VMT) within the local airshed and the SJVAB. Locally, construction traffic would be added to the roadway system in the vicinity of the project site. Although the SJVAB is currently an attainment area for CO, there is a potential for the formation of microscale CO “hotspots” to occur immediately around points of congested traffic. Hotspots can form if such traffic occurs

during periods of poor atmospheric ventilation, is composed of a large number of vehicles cold-started and operating at pollution-inefficient speeds, and/or is operating on roadways crowded with non-project traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SJVAB is steadily decreasing.

The SJVAPCD GAMAQI states that a quantitative CO hotspots analysis be performed if either of the following two conditions exist: a traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F; or a traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the project vicinity.

The University Village Merced Traffic Impact Study (DKS 2021, Appendix M) includes analysis of how the project would affect intersection LOS in the project area. The results with mitigation showed that the LOS would be D or better during AM and PM peak hours at all 22 study area intersections. Therefore, the SJVAPCD screening threshold would not be exceeded and the project would not result in a CO hotspot or the potential to result in CO emissions that when totalled with the ambient concentrations would exceed a 1-hour concentration of 20 parts per million or an 8-hour average of 9 parts per million. The impact would be **less than significant.**

Health Impacts of Other Criteria Air Pollutants

Neither construction nor operation of the project would result in emissions that exceed the SJVAPCD's emission thresholds for any criteria air pollutants, including ROGs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. Construction of the project would not exceed the SJVAPCD threshold for ROGs. Specific ROGs may be TACs; however, ROGs are not expected to present risk of health impacts even if the specific ROGs associated with project construction aren't entirely known. Some ROGs would be associated with motor vehicles and construction equipment, while others are associated with architectural coatings, the emissions of which would not result in the exceedances of the SJVAPCD's threshold as shown in Tables 3.3-7 and 3.3-9. Generally, the ROGs in architectural coatings are of relatively low toxicity. Additionally, SJVAPCD Rule 4601 restricts the ROG content of coatings for both construction and operational applications.

In addition, ROGs and NO_x are precursors to O_3, for which the SJVAB is designated as nonattainment with respect to the NAAQS and CAAQS (the SJVAB is designated by the EPA as a nonattainment area for the 1-hour O_3 NAAQS standard and 1997 8-hour NAAQS standard). The health effects associated with O_3, as discussed previously in the State Regulations portion of the Regulatory Setting section, are generally associated with reduced lung function. The contribution of ROGs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SJVAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions

to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the ROG emissions would occur because exceedances of the O_3 ambient air quality standards tend to occur between April and October, when solar radiation is highest.

The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods to assess this impact. Nonetheless, the ROG and NO_x emissions associated with project construction could minimally contribute to regional O_3 concentrations and the associated health impacts. As described in the previously in the Environmental Setting section, O_3 health impacts are associated with respiratory irritation, which may be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. The project would not exceed the SJVAPCD threshold for O_3 precursor NO_x during construction or operation thus impacts would be less-than-significant. Additionally, construction would be short-term in duration, lasting only 28 months, and the long-term operational emissions would not exceed any significance thresholds for O_3 precursors.

Construction of the project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Health effects that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. Project construction would be relatively short-term, and off-road construction equipment would be operating at various portions of the site and would not be concentrated in one portion of the site at any one time. In addition, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Operation of the project would not require use of any stationary sources (e.g., diesel generators and boilers) that would create substantial, localized NO_x impacts.

CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots was discussed previously and is determined to be a less-than-significant impact. Thus, the project's CO emissions would not contribute to significant health effects associated with this pollutant.

Construction and operation of the project would also not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the SDAB from coming into attainment for these pollutants. The proposed project would also not result in substantial DPM emissions during construction and operation, and therefore would not result in significant health effects related to DPM exposure. Additionally, the proposed project would implement dust control strategies and be required to comply with SJVAPCD Rule 8021, which limits the amount of fugitive dust generated during construction. Due to the minimal contribution of particulate matter during construction and operation, the project is not anticipated to result in exposure of sensitive receptors to substantial pollutant concentrations that would result in health effects associated with PM_{10} or $PM_{2.5}$.

Conclusion

In summary, construction of the project would not result in exceedances of the SJVAPCD significance thresholds and would not expose sensitive receptors to substantial concentration of pollutants or potential health effects associated with criteria air pollutants, and the impacts due to exposure to TACs and substantial concentrations of criteria air pollutants would be **less than significant**. However, potential exposure to the *C. immitis* fungus would result in a **potentially significant** impact before implementation of mitigation.

Mitigation Measures

Mitigation Measure 3.3a would be required to be implemented during all construction phases of the project, including any future development within the Remainder Area, to ensure that potential exposure to the *C. immitis* fungus and associated risk of contracting Valley Fever is minimized to the extent feasible and thus would reduce this impact to **less-than-significant**.

3.3a Prior to issuance of demolition permits and/or grading permits for The Crossings and any future construction within the Remainder Area, the City shall ensure that construction contracts include implementation of the following measures to reduce short-term fugitive dust impacts to workers and nearby sensitive receptors:

- Develop a Valley Fever Management Plan that addresses exposure to the *Coccidioides immitis (C. immitis)* fungus. The Plan shall be submitted to the City for review and approval prior to issuance of demolition permits and/or grading permits. The Plan shall include a program to limit the potential for exposure to *C. immitis* from construction activities and to identify appropriate worker training, dust management and safety procedures that shall be implemented, as needed, to minimize personnel and public exposure to *C. immitis*.
- Prior to commencement of any construction activities, the construction contractor shall train all workers to recognize the symptoms of Valley Fever, and to promptly report suspected symptoms of work-related Valley Fever to a supervisor.
- Throughout all ground-disturbance activities, the construction contractor shall audit and enforce compliance with relevant Cal OSHA health and safety standards on the jobsite – including injury and illness reporting requirements.
- Throughout all ground-disturbance activities, the construction contractor shall conduct job hazard assessments (JHAs) as defined under 8 CCR 1509 and/or 3380 for all job classifications employed on site. The hazard assessments will comprehend the potential for exposure to the Coccidioides spore relative to

work activity proximity to other forms of work activity, weather conditions and other relevant variables and will identify appropriate personal protective equipment based on current working conditions.

- If determined to be necessary by the JHA performed for the specific work task, affected employees should be provided a National Institute for Occupational Safety and Health (NIOSH) approved respiratory protection to reduce exposure to pollutants and the *C. immitis* fungus.
- Throughout all ground-disturbance activities, the construction contractor shall provide all construction personnel and visitors to the project site with information regarding Valley Fever. This would facilitate recognition of symptoms of Valley Fever and earlier treatment.

Impact 3.3-4: Implementation of the proposed project may result in other emissions, including those leading to odors. This would be a less-than-significant impact.

The Crossings and Remainder Area

Section 41700 of the California Health and Safety Code and SJVAPCD Rule 4102 (Public Nuisance), prohibit emissions from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property. Projects required to obtain permits from SJVAPCD are evaluated by SJVAPCD staff for potential odor nuisance, and conditions may be applied (or control equipment required) where necessary to prevent occurrence of public nuisance.

SJVACPD Rule 4102 (Public Nuisance) also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors. Odor issues are very subjective by the nature of odors themselves and due to the fact that their measurements are difficult to quantify. As a result, this guideline is qualitative and will focus on the existing and potential surrounding uses and location of sensitive receptors.

The occurrence and severity of potential odor impacts depends on numerous factors: the nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying, cause distress among the public, and generate citizen complaints.

Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the proposed project. Potential odors produced during proposed construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be **less than significant.**

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding facilities. The project entails a residential and retail buildings and would not result in the creation of a land use that is commonly associated with odors. Therefore, project operations would not result in odor emissions, and the project impact would be **less than significant.**

Mitigation Measures

No mitigation measures are required.

3.3.5 Cumulative Impacts

The geographic scope for consideration of cumulative air quality impacts is defined as the entire SJVAB because air quality is monitored and regulated based on air basin boundaries. Further, air quality impacts are generally considered to be a cumulative impact because individual land development projects are typically not large enough to create a significant impact independent of the existing air quality conditions and other sources of air pollutant emissions in the region. This is recognized in the SJVAPCD GAMAQI, which states:

> By its very nature, air pollution has a cumulative impact. The District's nonattainment status is a result of past and present development within the San Joaquin Valley Air Basin (SJVAB). Furthermore, attainment of ambient air quality standards can be jeopardized by increasing emissions-generating activities in the region. 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 within the San Joaquin Valley Air Basin.

Additionally, the Sacramento Metropolitan Air Quality Management District (SMAQMD) Guide to Air Quality Assessment describes cumulative air quality issues as follows (SMAQMD 2020):

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.

Impact 3.3-5: Ongoing development in the City of Merced would result in increased emissions of criteria pollutants in the SJVAB, which is a significant cumulative impact. However, the proposed project would not generate emissions that exceed SJVAPCD significance thresholds and therefore would not result in a cumulatively considerable net increase of criteria pollutants. The project's impact would remain less than significant.

As discussed in the Environmental Setting section and Impact 3.3-2, the SJVAB is in nonattainment status for various criteria air pollutants. This nonattainment status is a result of past and present development. The City's General Plan EIR recognized that ongoing development within the City would generate new construction and operational emissions of ROGs, NOx, CO, PM_{10} and $PM_{2.5}$, and found that due to the SJVAB non-attainment status, these ongoing and future emissions constitute a significant cumulative impact because they would adversely affect the ability of the region to achieve attainment with applicable air quality standards. However, as discussed in Impact 3.3-2, the proposed project would not generate substantial construction or operational emissions. The project would not impede implementation of the SJVAPCD Attainment Plans and would not exceed the SJVAPCD adopted significance thresholds. There are other approved and under construction development projects in the northern portion of the City, including residential development to the east and commercial development to the west. However each of these projects is of a scale that would also not generate substantial pollutant emissions during construction and none of these projects are in close enough proximity to the project site to create a potential for significant increases in the localized concentration of pollutants. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact identified in the City's General Plan EIR, and the project's impact would remain **less than significant**.

3.3.6 References Cited

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. https://www.arb.ca.gov/msprog/onrdiesel/documents/TBFinalReg.pdf.

13 CCR 2449–2449.3 and Appendix A. General Requirements for In-Use Off-Road Diesel-Fueled Fleets.14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended. https://www.arb.ca.gov/regact/2007/ordiesl07/frooal.pdf.

14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

17 CCR 93000. Substances Identified as Toxic Air Contaminants. In Subchapter 7, Toxic Air Contaminants. https://govt.westlaw.com/calregs/Document/I289F6230D60811DE88AEDDE29ED1DC0A?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1.

California Department of Finance. 2021. Table 2: E-5 City/County Population and Housing Estimates, 1/1/2020. May 2021. https://dof.ca.gov/Forecasting/Demographics/Estimates/e-5/documents/E-5_2021_InternetVersion.xlsx.

California Department of Public Health. 2017. Epidemiologic Summary of Coccidiodomycosis in California. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2017.pdf.

CAPCOA (California Air Pollution Control Officers Association). 2017. *California Emissions Estimator Model (CalEEMod) User's Guide Version 2016.3.2*. Prepared by BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts. November 2017. http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4.

CARB (California Air Resources Board). 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October 2000. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf.

CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005. http://www.arb.ca.gov/ch/landuse.htm.

CARB. 2015. Glossary of Terms Used in GHG Inventories. May 2015. Accessed August 2018 http://www.arb.ca.gov/cc/inventory/faq/ghg_inventory_glossary.htm.

CARB. 2016a. "Glossary of Air Pollution Terms." Accessed August 2018. http://www.arb.ca.gov/html/gloss.htm.

CARB. 2016b. "Ambient Air Quality Standards." May 4, 2016. Accessed August 2018. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

CARB. 2017a. "Area Designation Maps/State and National." Last updated October 18, 2017. http://www.arb.ca.gov/desig/adm/adm.htm.

CARB. 2018a. "iADAM: Air Quality Data Statistics." Accessed August 2018. http://www.arb.ca.gov/adam/topfour/topfour1.php.

EPA. 2016a. "Criteria Air Pollutants." July 21, 2016. Accessed August 2016. https://www.epa.gov/criteria-air-pollutants.

EPA. 2016b. "EPA Region 9 Air Quality Maps and Geographic Information." Last updated April 27, 2016. Accessed August 2016. http://www.epa.gov/region9/air/maps/.

EPA. 2018a. "AirData: Access to Air Pollution Data." Last updated July 31, 2018. Accessed August 2018. http://www.epa.gov/airdata/ad_rep_mon.html.

Merced County Association of Governments (MCAG). 2018. *2018 Regional Transportation Plan and Sustainable Communities Strategy*. Adopted August 2018. https://www.mcagov.org/307/2018-RTP.

SJVAPCD (San Joaquin Valley Air Pollution Control District). 2004. *2004 Extreme Ozone Attainment Demonstration Plan*.

SJVAPCD. 2007. *2007 PM_{10} Maintenance Plan and Request for Redesignation*. https://www.arb.ca.gov/planning/sip/sjvpm07/sjvtransmittal07.pdf.

SJVAPCD. 2008. *2008 $PM_{2.5}$ Plan*. Adopted April 30, 2008. http://www.valleyair.org/Air_Quality_Plans/AQ_Proposed_PM25_2008.htm.

SJVAPCD. 2009. *Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans*. https://www.arb.ca.gov/planning/sip/2007sip/sjv8hr/sjv_2009_ract_sip.pdf.

SJVAPCD. 2012. *2012 $PM_{2.5}$ Plan*. http://www.valleyair.org/Air_Quality_Plans/PM25Plans2012.htm.

SJVAPCD. 2013. *2013 Plan for the Revoked 1-Hour Ozone Standard*. Approved September 19, 2013. http://www.valleyair.org/Air_Quality_Plans/Ozone-OneHourPlan-2013.htm.

SJVAPCD. 2014b. *Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan*. June 19. Accessed January 2018. https://www.valleyair.org/Air_Quality_Plans/docs/2014-RACT-SIP.PDF.

SJVAPCD. 2015a. *Guidance for Assessing and Mitigating Air Quality Impacts*. Accessed February 2017. http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf.

SJVAPCD. 2015b. *2015 Plan for the 1997 $PM_{2.5}$ Standard.* https://www.arb.ca.gov/planning/sip/planarea/2015sjv/DistrictPlan.pdf.

SJVAPCD. 2015c. *2015 Annual Demonstration Report SIP Credit for Emission Reductions Generated Through Incentive Programs.* https://www.valleyair.org/MOP/docs/AnnualDemonstrationReport_081315.pdf.

Sacramento Metropolitan Air Quality Management District. 2020. *Guide to Air Quality Assessment*. http://airquality.org/Residents/CEQA-Land-Use-Planning/CEQA-Guidance-Tools.