City Of Merced Wastewater Collection System Master Plan

DRAFT ENVIRONMENTAL IMPACT REPORT

CHAPTER 3.3 AIR QUALITY

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Prepared for:
City of Merced
678 W 18th Street
Merced, CA 95340

Prepared by:
Stantec Consulting Services Inc.
3875 Atherton Road
Rocklin CA 95765-3716

Stantec

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3.3 AIR QUALITY

3.3.1 Basis for Analysis

The California Environmental Quality Act (CEQA) Guidelines' Appendix G Environmental Checklist was used during the Notice of Preparation (NOP) scoping process (included in Appendix A) to identify the Program components that have the potential to cause a significant impact. The following potential impacts were determined to warrant further evaluation within this Environmental Impact Report (EIR):

- 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.

The remainder of this section describes the regulatory and environmental setting to support the evaluation of the potential impacts and describes the impacts to air quality that may result from implementation of the Program identifying mitigation for significant impacts, where feasible.

3.3.2 Regulatory Framework

This section discusses the federal and state regulations, and local policies and objectives related to air quality and that are relevant to the Program.

3.3.2.1 Federal

Clean Air Act and National Ambient Air Quality Standards

The federal Clean Air Act (CAA), promulgated in 1963 and amended several times, thereafter, including the 1990 Clean Air Act amendments (CAAA), establishes the framework for modern air pollution control. The CAA directs the United States Environmental Protection Agency (USEPA) to establish national ambient air quality standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and particulate matter (PM). The NAAQS are divided into primary and secondary standards; the primary standards are set to protect human health within an adequate margin of safety, and the secondary standards are set to protect environmental values, such as plant and animal life. Table 3.3-1 summarizes the NAAQS and the California Ambient Air Quality Standards (CAAQS).

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

Pollutant	Averaging Time	California Standards [1,3]	National Standards [2]	
			Primary [3,4]	Secondary [3,5]
Ozone	1 hour	0.09 ppm	N/A	N/A
		(180 µg/m^3)	N/A	N/A
	8 hour	0.07 ppm	0.075 ppm	0.075 ppm
		(137 µg/m^3)	(147 µg/m^3)	(147 µg/m^3)
Carbon monoxide	8 hour	9 ppm	9 ppm	N/A
		(10 mg/m^3)	(10 mg/m^3)	N/A
	1 hour	20 ppm	35 ppm	N/A
		(23 mg/m^3)	(40 mg/m^3)	N/A
Nitrogen dioxide	Annual Average	0.03 ppm	0.053 ppm	0.053 ppm
		(57 mg/m^3)	(100 µg/m^3)	(100 µg/m^3)
	1 hour	0.18 ppm	N/A	N/A
		(339 mg/m^3)	N/A	N/A
Sulfur dioxide	Annual Average	N/A	80 ug/m^3	N/A
		N/A	(0.03 ppm)	N/A
	24 hour	0.04 ppm	0.14 ppm	N/A
		(105 mg/m^3)	(365 µg/m^3)	N/A
	3 hour	N/A	N/A	0.5 ppm
		N/A	N/A	1,300 µg/m^3
	1 hour	0.25 ppm	N/A	N/A
		(655 µg/m^3)	N/A	N/A
PM_{10}	Annual	20 µg/m^3	N/A	N/A
	24 hour	50 µg/m^3	150 µg/m^3	150 µg/m^3
$PM_{2.5}$	Annual	12 µg/m^3	15 µg/m^3	15 µg/m^3
	24 hour	N/A	35 µg/m^3	35 µg/m^3
Sulfates	24 hour	25 µg/m^3	N/A	N/A
Lead[6, 7]	30 day	1.5 µg/m^3	N/A	N/A
	Quarterly	N/A	1.5 µg/m^3	1.5 µg/m^3
	Rolling 3 Month Average[7]	N/A	0.15 µg/m^3	0.15 µg/m^3
Hydrogen Sulfide	1 hour	0.03 ppm	N/A	N/A
		(42 µg/m^3)	N/A	N/A
Vinyl Chloride[6]	24 hour	0.010 ppm	N/A	N/A
		(26 µg/m^3)	N/A	N/A

Pollutant	Averaging Time	California Standards [1,3]	National Standards [2]	
			Primary [3,4]	Secondary [3,5]
Visibility	1 observation	Extinction coefficient of 0.23 per kilometer; visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.	N/A	N/A

Notes:

N/A = Not Applicable

$\mu g/m^3$ = micrograms per cubic meter

°C = degrees Celsius

CARB = California Air Resources Board

mg/m^3 = milligrams per cubic meter

$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter

PM_{10} = particulate matter less than 10 microns in diameter

ppm = parts per million

torr. = unit of pressure defined as 1/760 of a standard atmosphere

1. California standards for ozone, carbon monoxide, sulfur dioxide (1- and 24-hour), nitrogen dioxide, PM_{10} and $PM_{2.5}$, and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

2. National standards, other than ozone, PM, and those based on annual averages or annual arithmetic mean, are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. 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 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 250°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 250°C and a reference pressure of 760 torr; ppm in this table refer to parts per million by volume (ppmv), or micromoles of pollutant per mole of gas.

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

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

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

7. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: CARB 2016a

The CAA requires states to submit a State Implementation Plan (SIP) for areas in nonattainment for NAAQS. The SIP, which is reviewed and approved by USEPA, must demonstrate how the NAAQS would be achieved. Failing to submit a plan or secure approval can lead to denial of federal funding and permits. In cases where the SIP fails to demonstrate achievement of the standards, USEPA is directed to prepare a federal implementation plan.

Clean Air Non-Road Diesel Rule

To reduce emissions from off-road diesel equipment, USEPA established a series of increasingly strict emission standards for new engines. Locomotives and marine vessels are exempt from this rule. Manufacturers of off-road diesel engines are required to produce engines meeting certain emission standards based on the model year that the engine was manufactured according to the following compliance schedule:

- Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower category.
- Tier 2 standards were phased in from 2001 to 2006.
- Tier 3 standards were phased in from 2006 to 2008.
- Tier 4 standards, which require add-on emissions-control equipment to attain them, were phased in from 2008 to 2015.

3.3.2.2 State

The California Air Resources Board (CARB) is responsible for establishing and reviewing the state standards, compiling the California SIP and securing approval of that plan from USEPA, conducting research and planning, and identifying toxic air contaminates (TACs). CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the county or regional level. Air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal CAA and California CAA.

California Clean Air Act and California Ambient Air Quality Standards

In 1988, the State legislature adopted the California CAA, which established a Statewide air pollution control program. Unlike the federal CAA, the California CAA does not set precise attainment deadlines. Instead, the California CAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Each air district's clean air plan is specifically designed to attain the standards and must be designed to achieve an annual 5 percent reduction in district-wide emissions of each nonattainment pollutant or its precursors. When an air district is unable to achieve a 5 percent annual reduction, the adoption of all feasible measures on an expeditious schedule is acceptable as an alternative strategy (Health and Safety Code Section 40914[b][2]). CAAQS are generally more stringent than NAAQS and incorporate additional standards for sulfates, hydrogen sulfide (H_2S), vinyl chloride (C_2H_3Cl), and visibility-reducing particles.

The CARB and local air districts are responsible for achieving CAAQS, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, the USEPA has delegated authority to prepare SIPs to CARB, which in turn, has delegated that authority to individual air districts. The CARB traditionally has established state air quality standards, maintains oversight authority in air quality planning, develops programs for reducing emissions from motor vehicles, develops air emission inventories, collects air quality and meteorological data, and approves SIPs.

The California CAA substantially adds to the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The California CAA also emphasizes the control of indirect and area-wide sources of air pollutant emissions and gives local air pollution control districts explicit authority to regulate indirect sources of air pollution.

Toxic Air Contaminants

A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. The *California Almanac of Emissions and Air Quality* (CARB 2013) presents the relevant concentration and cancer-risk data for the ten TACs that pose the most substantial health risk in California based on available data. These TACs are as follows: acetaldehyde, benzene, 1.3-butadiene, carbon tetrachloride, hexavalent chromium, paradichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel PM (DPM).

Some studies indicate that DPM poses the greatest health risk among the TACs listed above. A 10-year research program (CARB 1998) demonstrated that DPM from diesel-fueled engines is a human carcinogen, and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk. In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well, and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

DPM differs from other TACs in that it is not a single substance but a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. However, unlike the other TACs no ambient monitoring data are available for DPM because no routine measurement method currently exists. The CARB has made preliminary concentration estimates based on a DPM exposure method. This method uses the CARB emissions inventory's PM less than 10 microns in diameter (PM_{10}) database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of DPM.

Sierra Club v. County of Fresno (Friant Ranch, L.P.)

In the Fifth District Court of Appeal case *Sierra Club v. County of Fresno* (Friant Ranch, L.P.), the Court found the Friant Ranch project EIR deficient because it did not identify specific health-related effects resulting from the estimated amount of pollutants generated by the project. The ruling stated that the EIR should give a "sense of the nature and magnitude of the 'health and safety problems' caused by a project's air pollution. The EIR should translate the emission numbers into adverse impacts or to understand why such translation is not possible at this time (and what limited translation is, in fact, possible)."

3.3.2.3 Local

San Joaquin Valley Air Pollution Control District

The Program Study Area is located within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD), which regulates air pollutant emissions for all sources throughout the San Joaquin Valley Air Basin (SJVAB) other than motor vehicles. The SJVAPCD enforces regulations and administers permits governing stationary sources. The SJVAPCD has developed the Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) to

provide technical guidance for the review of air quality impacts as they relate to projects within the jurisdiction of the SJVAPCD (SJVAPCD 2015).

The SJVAPCD also has numerous rules and regulations which are enforced by the California Health and Safety Code. The following rules, regulations, and plans would apply to the Program (CARB 2019):

Regulation IV (Prohibitions)

Regulation IV contains rules developed pursuant to USEPA guidance for specific prohibitions in the region. Rule 4101, Visibility, limits the visible plume from any source to 20 percent opacity. Rule 4102, Nuisance, prohibits the discharge of air contaminants or other materials in quantities that may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public or that endanger the comfort, repose, health, or safety of any such person or the public.

Regulation VIII (Fugitive PM_{10} Prohibitions)

Regulation VIII – Fugitive PM_{10} Prohibitions is a control measure that is one main strategies from the 2006 PM_{10} Plan for reducing the PM_{10} emissions that are part of fugitive dust. Projects greater than 10 acres are required to file a Dust Control Plan that contains dust control practices sufficient to comply with Regulation VIII. Regulation VIII contains rules developed pursuant to USEPA guidance for serious PM_{10} nonattainment areas. Rules included under this regulation limit fugitive PM_{10} emissions from the following sources: construction, demolition, excavation, extraction, and other earth moving activities, bulk materials handling, carryout and track-out, open areas, paved and unpaved roads, unpaved vehicle/equipment traffic areas, and agricultural sources. The City of Merced (City) would be required to implement the following control measures during project construction activities pursuant to Rule 8021, Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities.

- A.1: Pre-water site sufficient to limit visible dust emissions (VDE) to 20 percent opacity.
- A.2-: Phase work to reduce the amount of disturbed surface area at any one time.
- B.1: Apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20 percent opacity.
- B.2: Construct and maintain wind barriers sufficient to limit VDE to 20 percent opacity. If using wind barriers, control measure B1 above shall also be implemented.
- B.3: Apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit VDE to 20 percent opacity and meet the conditions of a stabilized unpaved road surface.
- C.1: Restrict vehicular access to the area.
- C.2: Apply water or chemical/organic stabilizers/suppressants, sufficient to comply with the conditions of a stabilized surface. If an area having 0.5 acre or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined in section 3.58 of Rule 8011.
- 5.3.1: An owner/operator shall limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour.

- 5.3.2: An owner/operator shall post speed limit signs that meet State and Federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads.

- 5.4.1: Cease outdoor construction, excavation, extraction, and other earthmoving activities that disturb the soil whenever VDE exceed 20 percent opacity. Indoor activities such as electrical, plumbing, dry wall installation, painting, and any other activity that does not cause any disturbances to the soil are not subject to this requirement.

- 5.4.2: Continue operation of water trucks/devices when outdoor construction excavation, extraction, and other earthmoving activities cease, unless unsafe to do so.

- 6.3.1: An owner/operator shall submit a Dust Control Plan to the Air Pollution Control Officer (APCO) prior to the start of any construction activity on any site that will include 10 acres or more of disturbed surface area for residential developments, or 5 acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. Construction activities shall not commence until the APCO has approved or conditionally approved the Dust Control Plan. An owner/operator shall provide written notification to the APCO within 10 days prior to the commencement of earthmoving activities via fax or mail. The requirement to submit a dust control plan shall apply to all such activities conducted for residential and non-residential (e.g., commercial, industrial, or institutional) purposes or conducted by any governmental entity.

- 6.3.3: The Dust Control Plan shall describe all fugitive dust control measures to be implemented before, during, and after any dust generating activity.

- 6.3.4: A Dust Control Plan shall contain all the [administrative] information described in Section 6.3.6 of this rule. The APCO shall approve, disapprove, or conditionally approve the Dust Control Plan within 30 days of plan submittal. A Dust Control Plan is deemed automatically approved if, after 30 days following receipt by the District, the District does not provide any comments to the owner/operator regarding the Dust Control Plan.

Rule 4102 (Nuisance)

Rule 4102 prohibits the discharge of air contaminants or other materials in quantities that may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public or that endanger the comfort, repose, health, or safety of any such person or the public.

Rule 9510 (Indirect Source Review)

Rule 9510, or the Indirect Source Review (ISR), is a control measure in the 2006 SJVAPCD PM_{10} Plan that requires nitrogen oxide (NO_X) and PM_{10} emission reductions from development projects in the San Joaquin Valley. The NO_X emission reductions help reduce the secondary formation of PM_{10} in the atmosphere (primarily ammonium nitrate and ammonium sulfate) and also reduce the formation of O_3. Reductions in directly emitted PM_{10} reduce particles such as dust, soot, and aerosols. Rule 9510 is also a control measure in the 2016 Plan for the 2008 8-Hour Ozone Standard. Developers of projects subject to Rule 9510 must reduce emissions occurring during construction and operational phases through onsite measures or pay off-site mitigation fees.

Rule 9510 requires that these development projects mitigate exhaust emissions from construction equipment greater than 50 horsepower to 20 percent below statewide average NO_X emissions and 45 percent below statewide average

PM_{10} exhaust emissions. This rule also requires applicants to reduce baseline emissions of NO_x and PM_{10} emissions associated with operations by 33.3 percent and 50 percent respectively over a period of 10 years.

Air Quality Management Plans

As required by the federal CAA and the California CAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether the standards have been achieved. Jurisdictions of nonattainment areas also are required to prepare an Air Quality management plan (AQMP) that includes strategies for achieving attainment. The SJVAPCD has approved AQMPs demonstrating how the SJVAB will reach attainment with the federal 1-hour and 8-hour ozone, PM_{10}, and PM less than 2.5 microns in diameter ($PM_{2.5}$) and California CO standards.

The SJVAPCD's most recent AQMP for ozone attainment is the 2016 Plan for the 2008 Eight-Hour Ozone Standard, which was adopted by the SJVAPCD in June 2016. The purpose of this plan is to achieve attainment with the federal 8-hour ozone ambient air quality standards in the SJVAB by 2031 (SJVAPCD 2016a).

The 2007 Ozone Plan approved by CARB on June 14, 2007, demonstrates how the SJVAB would meet the federal 8-hour ozone standard. The 2007 Ozone Plan includes a comprehensive list of regulatory and incentive-based measures to reduce emissions of ozone and PM precursors throughout the SJVAB. Additionally, this plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution and an increase in state and federal funding for incentive-based measures to create adequate reductions in emissions to bring the entire SJVAB into attainment with the federal 8-hour ozone standard. The 2016 Plan for the 2008 8-Hour Ozone Standard was adopted in Jun 2016 and ensures the attainment of the 75 parts per billion 8-hour ozone standard (SJVAPCD 2007a).

In June 2007, the SJVAPCD Board adopted the 2007 PM_{10} Maintenance Plan and Request for Redesignation. This plan demonstrates how PM_{10} attainment in the SJVAB will be maintained in the future. Effective November 12, 2008, USEPA redesignated the SJVAB to attainment for the PM_{10} NAAQS and approved the 2007 PM_{10} Maintenance Plan (SJVAPCD 2007b). In April 2008, The SJVAPCD Board adopted the 2008 $PM_{2.5}$ Maintenance Plan and approved amendments to Chapter 6 of the 2008 $PM_{2.5}$ Plan on June 17, 2010. This plan was designed to addresses USEPA's annual $PM_{2.5}$ standard of 15 micrograms per cubic meter ($\mu g/m^3$), which was established by USEPA in 1997. In December of 2012, the SJVAPCD adopted the 2012 $PM_{2.5}$ Plan, which addresses USEPA's 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$, which was established by USEPA in 2006. In April of 215, the SVAPCD adopted the 2015 Plan for the 1997 $PM_{2.5}$ Standard and adopted the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard in September 2016. On November 15, 2018, the SVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards to create an attainment strategy for the multiple $PM_{2.5}$ standards (SJVAPCD 2018).

Merced Vision 2030 General Plan

The City's Merced Vision 2030 General Plan (2030 General Plan), adopted January 3, 2012 (City of Merced 2012) contains policies that directly or indirectly pertain to air quality, including the following:

Goal SD-1: Air Quality and Climate Change

Policy SD-1.1 Acutely determine and fairly mitigated the local and regional air quality impacts of projects proposed in the City.

Policy SD-1.6. Reduce emissions of PM_{10} and other particulates with local control potential.

3.3.3 Environmental Setting

3.3.3.1 Regional Topography, Meteorology, and Climate

The Program Study Area is located in the SJVAB, which occupies the southern half of the Central Valley and comprises eight counties: San Joaquin, Stanislaus, Fresno, Merced, Madera, Kings, Tulare, and portions of Kern County. The SJVAB is about 250 miles long and 35 miles wide (on average) and is bordered by the Coast Range Mountains on the west, the Sierra Nevada mountains on the east, and the Tehachapi Mountains to the south. On the valley floor, the SJVAB is open only to the north, which heavily influences prevailing winds.

Although marine air generally flows into the SJVAB from the San Francisco Bay Area through the Carquinez Strait (a gap in the Coast Range Mountains) and low mountain passes such as Altamont Pass and Pacheco Pass, the mountain ranges restrict air movement through the SJVAB. Additionally, most of the surrounding mountains are above the normal height of summer inversion layers (1,500 to 3,000 feet). These topographic features result in weak airflow and poor dispersion of pollutants, and as a result, the SJVAB is highly susceptible to pollutant accumulation.

The average daily maximum and minimum summer temperatures (i.e., July) in Merced, California, are 96 degrees Fahrenheit (°F) and 62 °F, respectively, and the average daily maximum and minimum winter (i.e., January) temperatures are 54 °F and 37 °F, respectively. Average annual precipitation is 13.08 inches (U.S. Climate Data 2019).

3.3.3.2 Air Pollutants of Concern

NAAQS and the CAAQS are established for six criteria pollutants: O_3, CO, Pb, NO_2, SO_2, and PM. The following section discusses the criteria pollutants, as well as additional air pollutants of concern, TACs, and DPM.

Ozone

Ozone is a respiratory irritant that can cause severe ear, nose, and throat irritation and increase susceptibility to respiratory infections. It is also an oxidant that can cause extensive damage to plants through leaf discoloration and cell damage. It can cause substantial damage to other materials as well, such as synthetic rubber and textiles.

O_3 is a secondary pollutant not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. O_3 precursors, reactive organic gases (ROGs) and NO_X, react in the atmosphere in the presence of sunlight to form O_3 and can be formed many miles from the source of emissions. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, O_3 is primarily a summer air pollution problem. ROG and NO_X are mainly emitted by mobile sources and stationary combustion equipment.

Hydrocarbons are organic gases that are made up of hydrogen and carbon atoms. There are several subsets of organic gases, including ROGs and volatile organic compounds (VOCs). ROGs are defined by state rules and regulations, and VOCs are defined by federal rules and regulations. For the purposes of this assessment,

hydrocarbons are classified and referred to as ROGs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels or as a product of chemical processes. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants. Other common sources are petroleum fuels, solvents, dry-cleaning solutions, and paint (through evaporation).

The health effects of hydrocarbons result from the formation of O_3. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen though displacement. Carcinogenic forms of hydrocarbons are considered TACs. There are no separate health standards for ROGs, although some are also toxic; for example, benzene is both a ROG and a carcinogen.

Nitrogen Oxides

Nitrogen oxides are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone and react in the atmosphere to form acid rain. NO_2, often used interchangeably with NO_X, is a brownish, highly reactive gas that is present in all urban environments. The major human sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with O_3, the NO_2 concentration in a particular geographical area may not be representative of local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects primarily depends on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, such as coughing, difficulty breathing, vomiting, headaches, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, coughing, cyanosis, chest pain, and rapid heartbeat. Severe symptomatic NO_2 intoxication after acute exposure has been linked to prolonged respiratory impairment, with such symptoms as emphysema, bronchitis, and aggravating existing heart disease.

Carbon Monoxide

Carbon monoxide, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. In urban areas, motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains emit CO. Automobile exhaust is responsible for most of the CO in urban areas. CO is a nonreactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follows the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. These locally concentrated peaks in CO are referred to as CO “hotspots.” Because motor vehicles are the dominant source of CO emissions, CO hotspots are normally located near roads and freeways with high traffic volume.

Other Criteria Pollutants
Particulate Matter

PM pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. PM also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter less than 10 microns in diameter, about 1/7th the thickness of a human hair, is referred to as PM_{10}. Particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair, is referred to as $PM_{2.5}$. Major sources of PM_{10} include motor vehicles; 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. $PM_{2.5}$ results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, PM_{10} and $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and VOCs.

PM_{10} and $PM_{2.5}$ 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_{10} and $PM_{2.5}$ 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 Pb, sulfate (SO_4), and nitrates, can cause lung damage directly. These substances can be absorbed into the bloodstream and cause damage elsewhere in the body; they can also transport absorbed gases such as chlorides or ammonium into the lungs and cause injury. Whereas $PM_{2.5}$ and PM_{10} tend to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that these particles can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle and contribute to haze and reduce regional visibility.

Toxic Air Contaminants

Although NAAQS and CAAQS exist for criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or other acute (short-term) or chronic (long-term) health problems. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risks that they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health effects, a similar factor, called a Hazard Index, is used to evaluate risk. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). Examples of TAC sources include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources.

Sulfur Oxides

Sulfur oxides are any of several compounds of sulfur and oxygen, of which the most relevant to air quality is SO_2. SO_2 is a respiratory irritant that causes the bronchioles to constrict with inhalation at 5 parts per million or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis. SO_2 is produced by coal and oil combustion and such stationary sources as steel mills, refineries, and pulp and paper mills.

Lead

Lead is a natural metal constituent of air, water, and the biosphere; it is neither created nor destroyed in the environment, so it persists forever. Pb was used several decades ago to increase the octane rating in automotive fuel; therefore, gasoline-powered automobile engines were a major source of airborne Pb. Since the use of leaded fuel has been phased out, the ambient concentrations of Pb have dropped dramatically. Short-term exposure to high levels of Pb can cause vomiting, diarrhea, convulsions, coma, or even death. However, even small amounts of Pb can be harmful, especially to infants, young children, and pregnant women. Pb exposure is most serious for young children because they absorb Pb more easily than adults and are more susceptible to its harmful effects. Even low-level exposure may harm the intellectual development, behavior, size, and hearing of infants. During pregnancy, especially in the last trimester, Pb can affect the fetus. Female workers exposed to high levels of Pb have more miscarriages and stillbirths.

Symptoms of long-term exposure to lower Pb levels may be less noticeable but are still serious. Anemia is common, and damage to the nervous system may cause impaired mental function. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability, and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys.

Diesel Particulate Matter

In 1998, CARB identified DPM as a TAC (CARB 1998). On a statewide basis, the average potential cancer risk associated with DPM is more than 500 potential cases per million people. OEHHA estimated the potential cancer risk from a 70-year exposure to DPM at a concentration of 1 µg/m^3 ranges from 130 to 2,400 excess cancer cases per million people. A scientific review panel concluded that an appropriate point estimate of unit risk for a 70-year exposure to DPM is 300 excess cancer cases per million people (CARB 2000).

DPM of greatest health concern are those in the categories of fine (PM_{10}) and ultra-fine ($PM_{2.5}$). These fine and ultra-fine particles may be composed of elemental carbon with adsorbed compounds, such as organic compounds, SO_4, nitrate, metals, and other trace elements. The fine and ultra-fine particles are respirable, which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lungs.

Valley Fever

San Joaquin Valley Fever (formally known as coccidioidomycosis) is an infectious disease caused by the fungus *Coccidioides immitis*. San Joaquin Valley Fever is also known as Valley Fever, Desert Fever, or Cocci. Infection is caused by inhalation of *Coccidioides immitis* spores that have become airborne when dry, dusty soil or dirt is disturbed by natural processes such as wind or earthquakes, or by human-induced ground-disturbing activities such as construction, farming, etc. Farmers, construction workers, and others who engage in soil-disturbing activities are at highest risk for Valley Fever.

While cases of Valley Fever have been reported throughout California, more than 75 percent of cases have been in the San Joaquin Valley (California Department of Public Health 2016). In 2014, there were 2,217 cases of Valley Fever in California, with the most reported in the Central Valley (Fresno Bee 2015). Anyone who lives, works, or travels in a Valley Fever area could contract Valley Fever; however, those most at risk of developing severe symptoms from Valley Fever include adults more than 60 years of age, African Americans, Filipinos, Hispanics,

pregnant women (especially in the later stages of pregnancy), persons with diabetes, and persons with weakened immune systems (California Department of Public Health 2016).

Farmers, construction workers, and others who engage in soil-disturbing activities are at the highest risk for developing Valley Fever. During the construction of two solar-power generating facilities in San Luis Obispo County, 1.2 cases of Valley Fever were observed per 100 workers (Centers for Disease Control and Prevention 2015). For comparison, the overall incidence in 2011 for states where Valley Fever is endemic (Arizona, California, Nevada, New Mexico, and Utah) was 42.6 cases per 100,000 residents (or approximately 0.43 cases per 100 people) (Centers for Disease Control and Prevention 2016).

Asbestos

Naturally occurring asbestos is found in serpentine soils in the foothills of California and can become ingested during earth-moving activities such as grading. The Naturally Occurring Asbestos Hazards Map was reviewed to determine if the Program would involve construction in areas of relative likelihood for the presence of naturally occurring asbestos (USGS 2011). The Program Study Area is not located in an area mapped as having, or otherwise known to have, ultramafic rock. serpentine, or naturally occurring asbestos. The nearest mapped unit is approximately 35 miles southwest of the Program Study Area (USGS 2011).

In addition to naturally occurring asbestos, many building materials, including pipelines, have the potential to contain asbestos and other hazardous materials that could cause damage to the environment and to people if disturbed. If material containing asbestos is disturbed, tiny fibers can become airborne, which could cause respiratory damage leading to lung disease or other pulmonary complications. Historically, asbestos-cement pipe, or more specifically the brand “Transite” for pipes, was used in the mid-1900s in potable water distribution systems, rather than in wastewater distribution systems (Exponent 2018). However, demolition of old wastewater distribution systems could still have a moderate risk of containing asbestos-cement pipe, which could pose a health risk if particles become airborne.

3.3.3.3 Existing Air Quality Conditions

The SJVAPCD operates a regional monitoring network that measures the ambient concentrations of criteria pollutants. Existing and probable future general levels of air quality in the SJVAB can generally be inferred from ambient air quality measurements conducted by SJVAPCD at its monitoring stations. The major criteria pollutants of concern in the Central Valley (i.e., O_3, PM_{10}, $PM_{2.5}$, CO, NO_2, and SO_2) are monitored at a number of locations. Background ambient concentrations of pollutants are determined by average pollutant emissions, wind patterns, and meteorological conditions in a given area. As a result, background concentrations can vary among different locations within the Program Study Area. However, areas located close together and exposed to similar wind conditions can be expected to have similar background pollutant concentrations. The closest SJVAPCD monitoring stations to the Program Study Area are the Merced-M Street Station and the Merced-Coffee Station, which collectively monitor O_3, NO_2, $PM_{2.5}$, and PM_{10}.

Attainment Status

Local monitoring data is used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are defined as follows.

- Nonattainment: assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance: assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment: assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- Unclassified: assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Table 3.3-2: Merced County State and Federal Attainment Status

Criteria Pollutant	State Designation	Federal Designation
Ozone	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Unclassified	Unclassified/Attainment
Nitrogen dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified/Attainment
Lead	Attainment	Unclassified/Attainment
Hydrogen Sulfide	Unclassified	-
Visibility Reducing Particles	Unclassified	-

$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
Source: CARB 2018; USEPA 2018

Merced County has been designated as nonattainment for O_3 and $PM_{2.5}$ by the USEPA and for O_3, PM_{10}, and $PM_{2.5}$ by CARB. Pollutants that are in nonattainment status can be categorized as moderate, severe, and extreme based on the concentration level of the pollutants.

3.3.3.4 Odors

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., emotional reaction) to physiological (e.g., nausea). With respect to odors, the human nose is the sole sensing device. The ability to detect odors is subjective and varies considerably among the population. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another.

Noxious odors associated with wastewater systems are generally created when the dissolved oxygen content of the wastewater decreases (becomes anoxic). When the wastewater becomes anoxic there are no oxygen molecules to oxidize the sulfates in the wastewater. Which means the sulfates instead combine with hydrogen to form hydrogen

sulfide (H_2S) (or that odor that smells like rotten eggs). Typically, hydrogen sulfides (and other mercaptans) are formed during low flow conditions or when the water in the sewer is flowing so slowly that it is not being aerated and goes anoxic. These odor-generating compounds then tend to settle with the sewage solids on the bottom of the wastewater system as flows decrease. When the flows increase the solids are stirred up releasing the odor-causing compounds into the air where they find their way up through manholes or other places where the gases can be released to the atmosphere. When designing wastewater systems (collection and treatment) engineers consider odor control into design which either creates a closed system where air cannot escape or provides treatment such as odor scrubbers which filter the air before it is released from the system.

3.3.3.5 Sensitive Receptors

Sensitive land uses to air quality impacts are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (e.g., 24-hour, 8-hour, and 1-hour). Typical sensitive receptors include residences, hospitals, and schools.

Sensitive receptors within the Program Study Area include residences throughout the Specific Urban Development Plan (SUDP)/Sphere of Influence (SOI), recreational users within recreational facilities (i.e., along bike paths or within a designated park), and commercial users throughout the SUDP/SOI. However, most development where substantial concentrations of people are located are typically within the developed areas of the City with scattered rural, residential, and industrial type receptors dominating the SUDP/SOI. Particularly, Along the Northern Trunk Sewer alignment, receptors are located in north Merced along limited portions of Cardella and Bellevue Roads and along G Street in between Cardella and Bellevue. The majority of the alignment includes rural residential agricultural properties or industrial type properties. Along Thornton Road this categorization holds true as well with more concentrated residential receptors located to the west of Northern Trunk Sewer Alignment from Santa Fe Drive to Highway 99. Additionally, there are more concentrated residential, commercial, and industrial receptors along the eastern side of Thornton Road between SR 140 and W Dickenson Ferry Road. There are also a few residential receptors along Belcher Avenue near Thornton Road near the proposed location for the Northern Trunk Sewer pump station. Similarly, the Southern Trunk Sewer alignment has rural residential, agricultural, industrial, and commercial receptors along E Mission Avenue, Campus Parkway, and W Dickenson Ferry Road. There are sensitive receptors within two miles of the WWTRF along Grove Road, S Grur Road, Roduner Road, and Highway 59, but the area is generally put to agricultural use, with very limited sensitive receptors.

As reasonable build-out occurs, it is anticipated that additional receptors would be added to the undeveloped areas of the Program Study Area; however, it is likely Program components would be installed before that development occurs. Additionally, there are numerous hospitals, schools, and parks within the Program Study Area and the developed areas described adjacent to the proposed Projects, (however, generally concentrated in the developed areas within the City limits and near the UC in north Merced) all of which contain sensitive receptors.

3.3.4 Environmental Impacts

This section analyzes the Program's potential to result in significant impacts to air quality. When a potential impact was determined to be potentially significant, feasible mitigation measures (MMs) were identified to reduce or avoid that impact.

3.3.4.1 Methodology for Analysis

Implementation of the Program would result in both short- and long-term emissions of criteria air pollutants. Construction emissions would include exhaust from the operation of conventional construction equipment and vehicles, from fugitive dust as a result of grading and equipment, and from vehicle travel on unpaved surfaces. The SJVAPCD GAMAQI adopted in 2015 (See Section 3.3.2, Regulatory Framework) contains thresholds for CO, NO_X, ROG, sulfur oxides (SO_X), PM_{10}, and $PM_{2.5}$ and other air quality impacts such as odors. Program-generated construction and operation emissions of criteria air pollutants, precursors, and odors were assessed in accordance with SJVAPCD recommended methods and thresholds. Assessed criteria pollutants and precursors are shown in Table 3.3-3. If emissions exceed the SJVAPCD significance thresholds, mitigation measures would be required for the impacts to be considered less than significant.

Table 3.3-3: Air Quality Thresholds of Significance for Criteria Air Pollutants

Pollutant/Precursor	Tons per Year	
	Construction Emissions	Operational Emissions
NO_X	10	10
CO	100	100
ROG	10	10
SO_X	27	27
PM_{10}	15	15
$PM_{2.5}$	15	15

Notes:
CO = carbon monoxide
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
ROG = reactive organic gas

The SJVAPCD has published guidance on determining the significance of localized impacts to state and federal ambient air quality standards in its GAMAQI. State and federal ambient air quality standards have been established to protect public health and welfare from the adverse impacts of air pollution. A project would be considered to have a significant impact if its emissions are predicted to cause or contribute to a violation of any CAAQS or NAAQS or other standards related to air hazards or odors. The SJVAPCD applies a threshold of 100 pounds per day of any criteria pollutant as a screening threshold. If the Project does not exceed 100 pounds per day of any criteria pollutant, then it can be assumed that it would not cause a violation of an ambient air quality standard. If a project exceeds 100 pounds per day, then additional refined modeling would be necessary to determine if the emissions would cause an exceedance of the CAAQS or NAAQS.

The SJVAPCD also provides the following thresholds of significance for TAC emissions from operation of both permitted and non-permitted sources:

- Carcinogens: Maximally Exposed Individual risk equals or exceeds 20 in a million

- Non-Carcinogens: Acute and Chronic Hazard Index equals or exceeds 1 for the Maximally Exposed Individual

Construction and operational emissions were estimated using the California Emissions Estimator Model (version 2016.3.2) (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutants associated with both construction and operation of a variety of land use projects. The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as greenhouse gas emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use.

The model was developed in collaboration with the air districts in California. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is an accurate and comprehensive tool for quantifying air quality impacts from land use projects throughout California. The model can be used for a variety of situations where an air quality analysis is necessary or desirable, such as CEQA documents. For the Program, a general discussion surrounding anticipated impacts associated with implementation of the Program was developed based on the quantification and evaluation of the three proposed Projects identified under the Program in the Section 2.0, Project Description: new Northern Trunk Sewer, new Southern Trunk Sewer, and the Wastewater Treatment and Reclamation Facility (WWTRF) Expansion that would have the capacity to treat an additional 35 million gallons per day (Mgal/day) anticipated to be constructed in 4 to 5 Mgal/day increments (and thus modeled for construction of a 4 to 5 Mgal/day increase). These proposed Projects were evaluated and modeled broken into three models: Northern Trunk Pipeline, Southern Trunk Pipeline, and WWTRF Expansion Construction. These models considered each Project's impact areas, construction equipment usage, and timing of construction. Model results were used to capture and evaluate the relevant air quality related information for each specific Project. Consultation with the City and Stantec engineers was conducted to document assumptions needed for model inputs for areas such as grading calculations, equipment vehicle use, and construction schedule. (Air Quality and Greenhouse Gas Assumptions Memorandum is provided in Appendix C).

3.3.4.2 Impact Analysis

Impact AIR-1 Potential to conflict with or obstruct implementation of the applicable air quality plan.

Impact AIR-1 Analysis
Combined Program/Proposed Projects Impacts

Construction and Operation

The CEQA Guidelines indicate that a significant impact would occur if the project would conflict with or obstruct implementation of the applicable Air Quality Plan (AQP) (See Section 3.3.2, Regulatory Framework). The GAMAQI does not provide specific guidance on analyzing conformity with the AQP. Therefore, this document proposes the following criteria for determining project consistency with the current AQPs:

1. Will the project result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQPs? This measure is determined by comparison to the regional and localized thresholds identified by the District for regional and local air pollutants.

2. Will the project comply with applicable control measures in the AQPs? The primary control measures applicable to development projects is Regulation VIII – Fugitive PM10 Prohibitions and Rule 9510 Indirect Source Review.

Contribution to Air Quality Violations

A measure for determining whether the Program and proposed Projects are consistent with the AQPs is whether they would result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQPs. Regional air quality impacts and attainment of standards are the result of the cumulative impacts of all emission sources within the air basin.

Individual projects are generally not large enough to measurably contribute to an existing violation of air quality standards. Therefore, the cumulative impact of the project is based on its cumulative contribution. Because of the region's nonattainment status for O_3, $PM_{2.5}$, and PM_{10}, if Program or proposed Project-generated emissions of either of the O_3 precursor pollutants (ROG and NO_X), PM_{10}, or $PM_{2.5}$ would exceed the SJVAPCD's significance thresholds, they would be considered to contribute to violations of the applicable standards and would conflict with the attainment plans.

As discussed in Impact AIR-2, emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with the construction and operation of the proposed Projects would not exceed the SJVAPCD's significance thresholds and other activities under the proposed Project are anticipated to be smaller than the proposed Project and also would not exceed the thresholds; therefore, the Program nor the proposed Project would not contribute to air quality violations.

Compliance with Applicable Control Measures

The AQP contains a number of control measures, which are requirements that are enforceable through the adoption of rules and regulations. A description of rules and regulations that apply to this project is provided below.

- **SJVAPCD Rule 9510** – The proposed Projects and future projects under the Program would comply with the Rule 9510 ISR by implementing control measures to achieve emission reductions, implementation of onsite measures, or payment of off-site mitigation fees.
- **Regulation VIII Fugitive PM_{10} Prohibitions** – Fugitive PM_{10} Prohibitions would be required for the proposed Projects and future projects under the Program that are greater than 10 acres. Projects greater than 10 acres are required to file a Dust Control Plan that contains dust control practices sufficient to comply with Regulation VIII. The proposed Projects and projects greater than 10 acres would be required to prepare a Dust Control Plan to comply with Regulation VIII and thereby do not conflict with or obstruct implementation.
- **Rule 4641 Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operation** – Paving and maintenance operations of the proposed Projects and future projects under the Program would be required to reach a reduction in VOC emissions during paving and thereby do not conflict with or obstruct implementation.
- **Rule 4601 Architectural Coatings** – Architectural Coatings associated with the proposed Projects and future projects under the Program would be limited to the selection of architectural coatings for low VOC

content consistent with the paints and coatings sold in the San Joaquin Valley and thereby does not conflict with or obstruct implementation.

The project would comply with all applicable SJVAPCD rules and regulations. Therefore, the project would comply with this criterion and would not conflict with or obstruct implementation of the applicable air quality attainment plan.

Compliance with the 2030 General Plan

When the City's 2030 General Plan was adopted in 2012 it found it was inconsistent with the SJVAPCD AQP because the emissions at buildout exceeded the criteria pollutant emission thresholds (see Impact Number 3.3-2 of the 2030 General Plan Draft EIR, Merced 2010). At the time, the City found the impact to be significant and unavoidable and adopted a Statement of Overriding Considerations (SOC) for the conflict. Since that time, the AQP's have been updated and have accounted for the reasonable build-out growth projections within the 2030 General Plan. This means that the Program's accommodation of the 2030 General Plan growth is now consistent with the goals and Plans of the SJVAPCD AQQ and the 2016 Plan for the 2008 8-Hour Ozone Standard, the 2015 Plan for the 1997 $PM_{2.5}$ Standard, and the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard.

Projects that are consistent with the 2030 General Plan policies and comply with the mitigation measures included in the 2030 General Plan mitigation measures are able to rely upon the SOC finding to address their cumulative air quality impacts and may have a lesser impact themselves since they are consistent with the AQP. The 2030 General Plan EIR indicates that implementation of the General Plan policies and implementation actions would reduce impacts to the extent feasible. The proposed Projects and future projects under the Program are determined to be consistent with applicable General Plan policies and implementation actions as described in Table 3.3-4.

Table 3.3-4: Consistency with Applicable 2030 General Plan Policies

General Plan Policy	Project Consistency
Policy SD-1.1 Acutely determine and fairly mitigated the local and regional air quality impacts of projects proposed in the City.	**Consistent.** The Program and proposed Projects' emissions estimates have been quantified to determine the relative air quality impacts and mitigation measures have been incorporated to reduce potential impacts to a less than significant level.
Policy SD-1.6. Reduce emissions of PM_{10} and other particulates with local control potential.	**Consistent.** The City requires compliance with Regulation VIII to reduce PM_{10} emissions. The Program and proposed Project would comply with this measure.

Note:
PM_{10} = particulate matter less than 10 microns in diameter

The air quality mitigation measures and standard conditions from the 2030 General Plan EIR and a discussion of project compliance with each measure are provided in Table 3.3-5.

Table 3.3-5: Consistency with Applicable 2030 General Plan EIR Mitigation Measures

General Plan EIR Mitigation Measure	Project Compliance
Mitigation Measure #3.3-1a: For any phase of construction in which an area greater than 22 acres, in accordance with Regulation VIII of the	**Consistent**. The Program and proposed Projects would comply with this mitigation measure through preparation

General Plan EIR Mitigation Measure	Project Compliance
SJVAPCD, will be disturbed on any one day, the project developer(s) shall implement the following measures: 1. Basic fugitive dust control measures are required for all construction sites by SJVAPCD Regulation VIII. 2. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent. 3. Traffic speeds on unpaved roads shall be no greater than 15 mph. 4. Install wind breaks at windward side(s) of construction areas	of dust control plans/dust control notifications as needed to comply with Regulation VIII.
Mitigation Measure #3.3-1b: To reduce emissions and thus reduce cumulative impacts, the City of Merced shall consider adoption of an ordinance requiring the following measures to be implemented in conjunction with construction projects within the City: 1. The idling time of all construction equipment used in the plan area shall not exceed ten minutes when practicable. 2. The hours of operation of heavy-duty equipment shall be minimized when practicable. 3. All equipment shall be properly tuned and maintained in accord with manufacturer's specifications when practicable. 4. When feasible, alternative fueled or electrical construction equipment shall be used at the project site. 5. The minimum practical engine size for construction equipment shall be used when practicable. 6. When feasible, electric carts or other smaller equipment shall be used at the project site. 7. Gasoline-powered equipment shall be equipped with catalytic converters when practicable.	**Not applicable.** This is a City-wide measure; however, the Program and proposed Projects would implement many of the measures being considered for a City ordinance as part of Mitigation Measure AIR-3.

Notes:
City = City of Merced
mph = miles per hour
SJVAPCD = San Joaquin Valley Air Pollution Control District

Conclusion

As shown in Tables 3.3-4 and 3.3-5, the Program and proposed Projects would be consistent with the 2030 General Plan, and as shown in Impact AIR-2, the emissions would be less than significant. Therefore, the Program and proposed Projects would not conflict with the applicable AQPs. The impact would be less than significant.

Level of Significance Prior to Mitigation: Less than Significant

Mitigation Required: No mitigation is required.

Level of Significance After Mitigation: Less than Significant

Impact AIR-1 Findings

Impact AIR-1 Overall Level of Significance Prior to Mitigation: Less than Significant

Impact AIR-1 Mitigation Required: No mitigation is required

Impact AIR-1 Overall Level of Significance After Mitigation: Less than Significant

Impact AIR-2	**Potential to 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.**

Impact AIR-2 Analysis
Combined Program/Proposed Project Impacts

To result in a less than significant impact, the following criteria must be true:

- Regional analysis: emissions of nonattainment pollutants must be below the SJVAPCDs regional significance thresholds. This is an approach recommended by the SJVAPCD in its GAMAQI.
- Summary of projections: the project must be consistent with current air quality attainment plans including control measures and regulations. This is an approach consistent with Section 15130(b) of the CEQA Guidelines.
- Cumulative health impacts: the project must result in less than significant cumulative health effects from the nonattainment pollutants. This approach correlates the significance of the regional analysis with health effects, consistent with the court decision, *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1219-20.

Regional Emissions

Air pollutant emissions have both regional and localized effects as described in Section 3.3.3, Environmental Setting. This analysis assesses the regional effects of the Program and proposed Project's criteria pollutant emissions in comparison to SJVAPCD thresholds of significance for short-term construction activities and long-term operation of the Program and Projects. Localized emissions from construction and operation are assessed under Impact AIR-3 using concentration-based thresholds that determine whether the Program or Projects would result in a localized exceedance of any ambient air quality standards or would make a cumulatively considerable contribution to an existing exceedance.

The primary pollutants of concern during construction and operation as described in Impact AIR-1 and Section 3.3.3.2, Air Pollutants of Concern, are ROG, NO_X, PM_{10}, and $PM_{2.5}$. The SJVAPCD GAMAQI adopted in 2015 contains thresholds for CO, NO_X, ROG, SO_X, PM_{10}, and $PM_{2.5}$. As described in Section 3.3.4.1, Methodology for Analysis and illustrated in Table 3.3-6.

The SJVAB often exceeds the state and national O_3, PM_{10}, and $PM_{2.5}$ standards. Therefore, if the Program emits a substantial quantity of ozone precursors (NO_X or ROG), PM_{10}, or $PM_{2.5}$, the Program may contribute to an exceedance of the standards. The SJVAPCD's annual emission significance thresholds used for the Program and the

proposed Projects define the substantial contribution for both operational and construction emissions is shown in Table 3.3-3.

Construction

Construction emissions were modeled for the proposed Projects using CalEEMod and reasonable assumptions were extrapolated out for other Program activities based on the assumption that the remainder of Program activities would have smaller footprints than the proposed Projects and would take place in subsequent years (See Table 3.3-7). For assumptions used in estimating emissions please refer to Appendix B. As shown in Table 3.3-6, short-term construction emissions would not exceed the applicable significance thresholds for any criteria pollutants either individually or combined.

Table 3.3-6: Unmitigated Proposed Project Construction Emissions

Year	Project Component	Pollutants (tons/year)					
		ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
2022	Northern Trunk Sewer	0.20	1.97	2.31	0.01	0.29	0.15
	Southern Trunk Sewer	0.10	0.95	1.30	0.00	0.30	0.15
	WWTRF 4 to 5 Mgal/d	0.12	1.01	1.39	0.00	0.40	0.21
	Total	**0.42**	**3.93**	**4.99**	**0.01**	**0.99**	**0.52**
	SJVAPCD Significance Thresholds	10	100	10	27	15	15
	Individually Exceed Threshold	No	No	No	No	No	No
	Exceed Threshold when Combined	No	No	No	No	No	No
2023	Northern Trunk Sewer	0.18	1.91	2.07	0.01	0.19	0.09
	Southern Trunk Sewer	0.05	0.53	0.61	0.00	0.06	0.03
	WWTRF 4 to 5 Mgal/d	0.07	0.77	0.74	0.00	0.07	0.04
	Total	**0.31**	**3.21**	**3.42**	**0.01**	**0.32**	**0.16**
	SJVAPCD Significance Thresholds	10	100	10	27	15	15
	Individually Exceed Threshold	No	No	No	No	No	No
	Exceed Threshold when Combined	No	No	No	No	No	No
2024	Northern Trunk Sewer	0.04	0.44	0.41	0.00	0.04	0.02
	Total	**0.04**	**0.44**	**0.41**	**0.00**	**0.04**	**0.02**
	SJVAPCD Significance Thresholds	10	100	10	27	15	15
	Individually Exceed Threshold	No	No	No	No	No	No
	Exceed Threshold when Combined	No	No	No	No	No	No

Notes:

CO = carbon monoxide
Mgal/d = million gallons per day
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District
WWTRF = Wastewater Treatment and Reclamation Facility

Construction of additional trunk and collector sewer pipelines to new development within the Program Study Area would occur for the duration of the program buildout. Emissions associated with development within the 2030 General Plan were accounted for in the 2030 General Plan Draft EIR. Construction equipment usage over the short-term construction period (several days to several months) makes these Program components minimal with respect to construction emissions; conservatively estimated to represent 10 percent of the proposed Projects' construction emissions. Table 3.3-7 provides a summary of potential construction emissions from these Program components.

Table 3.3-7: Unmitigated Proposed Program Construction Emissions Estimates

Component	Pollutants (tons/year)					
	ROG	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Total Construction Emissions Associated with Project Components	0.77	7.58	8.82	0.02	1.35	0.69
Programmatic Component	0.08	0.76	0.88	0.00	0.14	0.07
SJVAPCD Significance Thresholds	10	100	10	27	15	15
Exceed Threshold	No	No	No	No	No	No

Notes:
CO = carbon monoxide
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District

As shown in Table 3.3-7, based on smaller footprints and shorter duration of construction, future Program components implemented under reasonable build-out conditions would not exceed thresholds of significance. Additionally, due to construction timing, costs, and feasibility, implementation of all the proposed Projects would not occur at once, but even if they were, the combined emissions would not result in a significant impact related to construction emissions.

Operation

Program operational emissions are expected to be similar to existing operations, largely consisting of mobile-source-related emissions (i.e., worker commute trips, periodic facility maintenance visits, and potentially the addition of biosolids haul trips). Operational trips associated with the WWTRF expansions would differ slightly from the new trunk sewer infrastructure, as the additional WWTRF facilities would increase biosolids generation and would require

additional annual truck trips associated with biosolids handling and disposal. It is anticipated that current practices of land-applying biosolids to agricultural areas within the WWTRF footprint would continue, and increased generation of biosolids would not require a substantial increase in the number of haul trips since they would continue to be applied to agriculture lands at the WWTRF and surrounding City agricultural properties. However, there is the potential that land application may not be a viable option for biosolids disposal in the future, in which case, biosolids would require transport to an offsite disposal site potentially more than 20 miles away from the WWTRF. These additional truck trips would equate to approximately 621 truck trips per year, or two truck trips per day. The addition of two truck trips per day would not result in a substantial increase in emissions above the existing conditions within the Program Study Area (with trucks entering and existing the facility for daily workers arriving at the WWTRF, maintenance, and other daily operations at the WWTRF involving diesel vehicles). The operation of the wastewater collection system would include operation of pump stations, much like the current operations and would include the new Northern Trunk Sewer pump station. Pump stations within the system are designed with backup generator to provide system redundancy in the event of unplanned electrical outages and require periodic testing for maintenance purposes. These back-up generators are, just that and only run as needed. As an SJVAPCD permitted low use engine, the hours of the generator would be within the limited maximum of 100 hours for the year. Table 3.3-8 presents the summary of the estimated total operational emissions of the Program and the Proposed Projects.

Table 3.3-8: Unmitigated Proposed Program Operational Emissions Estimates

Program Component	Pollutants (tons/year)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Mobile Sources	0.001	0.009	0.047	0.0002	0.0054	0.0015
Stationary Sources (Generator)	0.049	0.1255	0.1062	0.0002	0.0007	0.0007
SJVAPCD Significance Thresholds	10	100	10	27	15	15
Individually Exceed Threshold	No	No	No	No	No	No
Exceed Threshold when Combined	No	No	Yes	No	No	No

Notes:
The SJVAPCD considers stationary sources separately for significance determination.
CO = carbon monoxide
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District

Summary of Cumulative Projections

In accordance with CEQA Guidelines 15130(b), the analysis of cumulative impacts is based on a summary of projections associated with reasonable build-out of the SUDP/SOI as presented in the City's 2030 General Plan (and further analyzed in Chapter 5.0). The SJVAPCD attainment plans are based on a summary of projections that accounts for projected growth throughout the SJVAB, and the controls needed to achieve ambient air quality standards. This analysis considers the current CEQA Guidelines, which includes the amendments approved by the California Natural Resources Agency, effective on December 28, 2018. The SJVAB is in nonattainment or

maintenance status for O_3 and PM (PM_{10} and $PM_{2.5}$), which means that concentrations of those pollutants currently exceed the ambient air quality standards, or that the standards have recently been attained in the case of pollutants with maintenance status. When concentrations of O_3, PM_{10}, or $PM_{2.5}$ exceed the ambient air quality standard, then those who are sensitive to air pollution, such as children, the elderly, and the infirm, could experience health effects such as decrease of pulmonary function and localized lung edema in humans and animals; increased mortality risk; and risk to public health implied by altered connective tissue metabolism, altered pulmonary morphology in animals after long-term exposures, and pulmonary function decrements in chronically exposed humans.

Under the CEQA Guidelines, cumulative impacts may be analyzed using other plans that evaluate relevant cumulative effects. The geographic scope for cumulative criteria pollution from air quality impacts is the SJVAB because that is the area in which the air pollutants generated by the sources within the SJVAB circulate and are often trapped. The SJVAPCD is required to prepare and maintain air quality attainment plans and an SIP to document the strategies and measures to be undertaken to reach attainment of ambient air quality standards. While the SJVAPCD does not have authority over land use decisions, it is recognized that changes in land use and circulation planning would help the SJVAB achieve clean air mandates. The SJVAPCD evaluated emissions from land uses and transportation in the entire SJVAB when it developed its attainment plans. Emission inventories used to predict attainment of NAAQS must be based on the latest planning assumptions for mobile sources.

In accordance with CEQA Guidelines Section 15064, Subdivision (h)(3), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously approved plan or mitigation program.

The 2007 8-Hour Ozone Plan contains measures to achieve reductions in emissions of ozone precursors and sets plans towards attainment of ambient O_3 standards by 2023. The 2012 $PM_{2.5}$ Plan and the 2015 $PM_{2.5}$ Plan for the 1997 $PM_{2.5}$ Standard require fewer NO_X reductions to attain the $PM_{2.5}$ standard than the Ozone Plan, so the Ozone Plan is considered the applicable plan for reductions of the ozone precursors NO_X and ROG. The 2012 $PM_{2.5}$ Plan requires reductions in directly emitted $PM_{2.5}$ from combustion sources, such as diesel engines and fireplaces, and from fugitive dust to attain the ambient standard and is the applicable plan for $PM_{2.5}$ emissions. $PM_{2.5}$ is also formed in secondary reactions in the atmosphere involving NO_X and ammonia to form nitrate particles. Reductions in NO_X that are required for O_3 attainment are also sufficient for $PM_{2.5}$ attainment. As discussed in Impact AIR-1, the Program, including its project components is consistent with all applicable control measures in the air quality attainment plans. The Program would comply with any SJVAPCD rules and regulations that may pertain to implementation of the AQPs. Therefore, impacts would be less than significant with regard to compliance with applicable rules and regulations.

Program Health Impacts

Consistent with the *Sierra Club v. County of Fresno* (Friant Ranch) (See Section 3.3.2, Regulatory Framework), the standard measure of the severity of impact is the concentration of pollutants in the atmosphere compared to the ambient air quality standard for the pollutant for a specified period. The severity of the impact increases with the concentration of the pollutant and the amount of time that people are exposed to the pollutant. The pollutants of concern in the Friant Ranch ruling were regional criteria pollutants O_3 and PM_{10}. It is important to note that the potential for localized impacts can be addressed through dispersion modeling. The SJVAPCD includes screening criteria that if exceeded, would require dispersion modeling to determine whether project emissions would result in a

significant health impact. For this Program, including its project components, no significant localized health impacts would occur. Regional pollutants require more complex modeling as described below.

O_3 concentrations are estimated using regional photochemical models because O_3 formation is subject to temperature, inversion strength, sunlight, emissions transport over long distances, dispersion, and the regional nature of the precursor emissions. The emissions from individual projects are too small to produce a measurable change in O_3 concentrations; it is the cumulative contribution of emissions from existing and new development that is accounted for in the photochemical model. O_3 concentrations vary widely throughout the day and year even with the same amount of daily emissions. The SJVAPCD indicated in an Amicus Brief on Friant Ranch that running the photochemical model with just Friant Ranch emissions (109.5 tons per year of NO_X) is not likely to yield valid information given the relative scale involved. The NO_X inventory for the San Joaquin Valley is 224 tons per day in 2019 or 81,760 tons per year. Under these conditions the Friant Ranch project would result in a 0.13 percent increase in NO_X emissions. A project emitting at the SJVAPCD CEQA threshold of 10 tons per year would result in a 0.01 percent increase in NO_X emissions. Most project emissions are generated by motor vehicle travel distributed on regional roadways miles from the project site, and these emissions are not suited to project-level modeling.

Emissions throughout the San Joaquin Valley are projected to markedly decline in the coming decade. The SJVAPCD 2016 Ozone Plan predicts that NO_X emissions will decline to 103 tons per day by 2029 or 54 percent from 2019 levels through implementation of control measures included in the plan. This means that O_3 health impacts to residents of the San Joaquin Valley would be lower than currently experienced, and most areas of the San Joaquin Valley would have attained O_3 air quality standards. The plan accounts for growth in population at rates projected by the State of California for the San Joaquin Valley, so only cumulative projects that would exceed regional growth projections would potentially delay attainment and prolong the time and the number of people that would experience health impacts. It is unlikely that anyone would experience greater impacts from regional emissions than currently occur. The federal transportation conformity regulation provides a means of ensuring that growth in emissions does not exceed emission budgets for each county. Regional Transportation Plans and Regional Transportation Improvement Plans must provide a conformity analysis based on the latest planning assumptions that demonstrates that budgets would be not be exceeded. If budgets are exceeded, the San Joaquin Valley may be subject to CAA sanctions until the deficiency is addressed. Thus, the Program's contributions were accounted for in regional planning considering reasonable build-out of the SUDP/SOI and thus, would not significantly contribute to increased health risks.

Particulate emission impacts can be localized and regional. Particulates can be directly emitted and can be formed in the atmosphere with chemical reactions. Small directly emitted particles, such as diesel emissions of DPM and other combustion emissions, can remain in the atmosphere for a long time and can be transported over long distances. Large particles, such as fugitive dust, tend to be deposited a short distance from where they are emitted but can also travel long distances during periods of high winds. Particulates can be washed out of the atmosphere by rain and deposited on surfaces. Secondary particulates formed in the atmosphere such as ammonium nitrate require NO_X and ammonia, and they require low inversion levels and certain ranges of temperature and humidity to result in substantial concentrations. These complications make modeling Program and associated project particulate emissions only feasible for directly emitted particles at receptor locations close to the proposed Project sites. Regional particulate concentrations are modeled using a gridded inventory (emissions in tons per day are placed a 4-kilometer, three-dimensional grid to spatially allocate the emissions geographically and vertically in the atmosphere) and an atmospheric chemistry component to simulate the chemical reactions. The model uses relative reduction

factors to determine the amount of reductions of each PM component that would be needed to attain the air quality standards on the days with the conditions most favorable to high particulate concentrations. A small project would not produce sufficient emissions to determine a project's individual contribution to the particulate concentration. Likewise, implementation of projects under the Program would be considered small projects and would not produce emissions substantial enough to be able to determine the project's individual contribution to the particulate concentration.

Cumulative Health Impacts

The SJVAB is in nonattainment for O_3, PM_{10} (state only), and $PM_{2.5}$, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect public health, including the health of sensitive individuals, such as children, the elderly, and the infirm. Therefore, when the concentration of those pollutants exceeds air quality standards, it is likely that some sensitive individuals in the population would experience health effects. However, the health effects are a factor of the dose-response curve. Concentration of the pollutant in the air (dose), the length of time exposed, and the response of the individual are factors involved in the severity and nature of health impacts. If a significant health impact results from Program emissions, it does not mean that 100 percent of the population would experience health effects.

Since the SJVAB is nonattainment for O_3, PM_{10}, and $PM_{2.5}$, it is considered to have an existing significant cumulative health impact without the Program. When this occurs, the analysis considers whether the Program's contribution to the existing violation of air quality standards is cumulatively considerable. The SJVAPCD regional thresholds for NO_X, VOCs, PM_{10}, or $PM_{2.5}$ are applied as cumulative contribution thresholds. Projects that exceed the regional thresholds would have a cumulatively considerable health impact. As shown in Tables 3.3-6, 3.3-7, and 3.3-8, the regional analysis of construction and operational emissions indicates that the Program and proposed Projects would not exceed the SJVAPCD's significance thresholds and would be consistent with the applicable AQP.

The SJVAPCD AQPs predict that nonattainment pollutant emissions would continue to decline each year as regulations adopted to reduce these emissions are implemented, accounting for growth projected for the region. Therefore, the cumulative health impact would also decline even with the Program's emission contribution and the impact would be less than significant.

Level of Significance Prior to Mitigation: Less than Significant

Mitigation Required: No mitigation is required

Level of Significance After Mitigation: Less than Significant

Impact AIR-2 Findings

Impact AIR-2 Overall Level of Significance Prior to Mitigation: Less than Significant

Impact AIR-2 Mitigation Required: No mitigation is required

Impact AIR-2 Overall Level of Significance After Mitigation: Less than Significant

Impact AIR-3 Potential to expose sensitive receptors to substantial pollutant concentrations.

Impact AIR-3 Analysis

Combined Program/Project Impacts

Construction associated with implementation of the Program would involve the operation of heavy equipment and activities that would temporarily produce additional dust and air emissions. Sensitive receptors within the Program Study Area include those described in Section 3.3.3.5, Sensitive Receptors and possibly the occasional recreationalist using the surrounding roadways. These sensitive receptors could be affected by construction-generated air emissions depending on location and distance and duration of construction activities. Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and duration of exposure to air pollutants. As previously stated, children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, childcare centers, playgrounds, retirement homes, convalescent homes, hospitals, and medical clinics.

Fugitive Dust

Fugitive dust is typically generated during earth-moving activities such as grading and excavation. Trenching activities associated Program components, including placement of pipelines and excavation for the pump station or WWTRF expansion would be among the earth-moving activities that could generate fugitive dust emissions. Fugitive dust can cause health concerns when airborne due to potential inhalation, and the proximity to residences along the new trunk sewer alignments combined with the flat topography of the area could allow dust from construction to effect sensitive receptors. The Program and proposed Project would comply with the SJVAPCD's Regulation VIII, which would require implementation of fugitive dust controls such as watering exposed soils and soils being transported offsite, as well as watering and maintaining speed limits on dirt roads. Compliance with Regulation VIII would dampen and secure loose soils that turn into fugitive dust when caught in the wind, effectively limiting emissions of fugitive dust from construction activities associated with the Program and proposed Project components.

Localized Pollutant Analysis

Emissions occurring at or near the proposed Project sites have the potential to create localized impacts, also referred to as an air pollutant hotspots. Localized emissions are considered significant if when combined with background emissions, they would result in exceedance of any health-based air quality standard. The impact from localized pollutants is based on the impact to the nearest sensitive receptor.

The SJVAPCD's GAMAQI includes screening thresholds for identifying projects that would need detailed analysis for localized impacts. Projects with onsite emission increases from construction activities or operational activities that exceed the 100 pounds per day screening level of any criteria pollutant after compliance with Rule 9510 and implementation of all enforceable mitigation measures would require preparation of an ambient air quality analysis. The criteria pollutants of concern for localized impact in the SJVAB are PM_{10}, $PM_{2.5}$, NO_X, and CO. There are no localized emission standards for ROG, and most types of ROG are not toxic and have no health-based standard; however, ROG was included for informational purposes only.

An ambient air quality analysis screening was prepared for the Program consistent with SJVAPCD guidance. The daily emissions are shown in Table 3.3-9. As shown in the table, the individual proposed Projects and projects combined would not exceed the SJVAPCD screening thresholds, and as such, a violation of an ambient air quality analysis would not occur, and the impact would be less than significant.

Table 3.3-9: Daily Air Pollutant Emissions During Construction

Year	Project Component	Pollutants (lbs/day)				
		ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
2022	Northern Trunk Sewer	1.55	14.96	17.52	2.23	1.15
	Southern Trunk Sewer	0.79	7.17	9.83	2.25	1.17
	WWTRF 4 to 5 Mgal/d	0.87	7.66	10.49	3.03	1.58
	Total	3.21	29.79	37.84	7.51	3.90
	SJVAPCD Screening Thresholds	-	100	100	100	100
	Individually Exceed Threshold	No	No	No	No	No
	Exceed Threshold when Combined	No	No	No	No	No
2023	Northern Trunk Sewer	1.37	14.47	15.65	1.44	0.71
	Southern Trunk Sewer	0.70	7.02	8.12	0.79	0.37
	WWTRF 4 to 5 Mgal/d	0.67	7.13	6.91	0.02	0.65
	Total	2.74	28.61	30.68	2.26	1.73
	SJVAPCD Screening Thresholds	-	100	100	100	100
	Individually Exceed Threshold	No	No	No	No	No
	Exceed Threshold when Combined	No	No	No	No	No
2024	Northern Trunk Sewer	0.96	10.58	9.78	1.00	0.48
	Total	0.96	10.58	9.78	1.00	0.48
	SJVAPCD Screening Thresholds	-	100	100	100	100
	Individually Exceed Threshold	No	No	No	No	No
	Exceed Threshold when Combined	No	No	No	No	No

Notes:
CO = carbon monoxide
lbs/day = pounds per day
Mgal/d = million gallons per day
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District
WWTRF = Wastewater Treatment and Reclamation Facility

Operational emissions are shown in Table 3.3-10. As shown in the table, the operational emissions would not exceed the SJVAPCD screening thresholds. Localized air quality impacts would be less than significant.

Table 3.3-10: Unmitigated Proposed Program Operational Emissions Estimates

Component	Pollutants (lbs/day)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Mobile Sources	0.008	0.0544	0.2629	0.00045	0.00043
Stationary Sources (Generator)	23.63	60.25	50.98	3.47	3.47
SJVAPCD Screening Thresholds	-	100	100	100	100
Individually Exceed Threshold	No	No	No	No	No
Exceed Threshold when Combined	No	No	Yes	No	No

Notes:
The SJVAPCD considers stationary sources separately for significance determination.
CO = carbon monoxide
lbs/day = pounds per day
NO_X = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 2.5 microns in diameter
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District

Valley Fever

Construction of the Program has the potential to generate substantial amounts of fugitive dust that may suspend Coccidioides spores and expose sensitive receptors. The Program Study Area is located in an area with elevated Valley Fever activity (California Department of Public Health 2016).

Given the endemic nature of the disease and the amount of earth-moving activities in the Program Study Area related to agriculture activities, as well as grading and excavation for new residential, commercial, and industrial development, it is not possible to attribute a specific case of Valley Fever to a specific earth-moving activity. Ground-disturbing activities represent a continual source of spores that contribute to the number of Valley Fever cases reported each year. Construction activities associated with the Program and proposed Projects identified would have additional localized ground-disturbing activities to those that occur continually within the Program Study Area, posing similar risks. This could be a potentially significant impact.

Fugitive dust control measures required by Regulation VIII, such as wetting the soil, would reduce fugitive dust minimizing exposure of Coccidioides spores to workers and receptors. It is important to educate construction personnel and provide awareness of potential exposure, symptoms, and control measures. MM AIR-1, Pre-Construction Worker Environmental Awareness Program (Air Quality), would be implemented to properly train construction workers about the symptoms of Valley Fever and to show steps that should be taken to prevent exposure and its spread while on the work site. MM AIR-1 would be required to educate construction personnel of

exposure, symptoms, and avoidance measures for earth-moving activities that would occur during implementation of the Program. Therefore, with the implementation of MM AIR-1, impacts related to Valley Fever from the Program would be less than significant.

Asbestos

As described in Section 3.3.3.2, Air Pollutants of Concern, the Program Study Area is not located in an area mapped as having or otherwise known to have ultramafic rock, serpentine, or naturally occurring asbestos. The nearest mapped unit is approximately 35 miles southwest of the Program Study Area (USGS 2011). Therefore, the statewide Asbestos Airborne Toxic Control Measures would not apply unless ultramafic rock or serpentine is discovered during grading or excavation of any of the Program. In the unexpected event that ultramafic rock or serpentine is discovered, a potentially significant impact prior to mitigation could occur. The SJVAPCD must be notified no later than the following business day, and Program implementation must comply with MM AIR-2, which includes compliance with the State of California Airborne Toxic Control Measures for Construction, Grading, Quarrying, and Surface Mining Operations. Additionally, although not anticipated, asbestos-cement pipelines could also be discovered during demolition of any of the old wastewater collection system, particularly in the older portions of the Program Study Area. Therefore, MM AIR-2 would also be implemented in these areas and would require a qualified geologist or geotechnical engineer to review historical documents and perform database searches to discover the likelihood of Program construction activities encountering, or requiring removal of, asbestos-containing materials. If the professional geologist or geotechnical engineer determines that no further analysis is warranted, then construction may proceed; however, if they determine that further investigation would be required, then geologic testing for asbestos would be performed in accordance with MM AIR-2 and regulatory requirements. It is important that construction personnel are provided awareness of potential exposure and control measures are educate them, increase the effectiveness of MM AIR-1 application, and minimize risk of exposure. MM AIR-1, Pre-Construction Worker Environmental Awareness Program (Air Quality), would be implemented to properly train construction workers about the long-term impacts associated with asbestos exposure and ways to prevent such exposure.

These MMs would be required for implementation of any of the Program components that would require earth movement to ensure that initial exposure would be reduced and long-term health impacts from exposure to asbestos would be avoided. Therefore, impacts associated with asbestos from construction of the Program would be less than significant with mitigation incorporated.

Toxic Air Contaminants

TACs, from the Program and proposed Projects are generally associated with construction impacts from implementation of activities including additional operational emissions from the expansions of the WWTRF and new pump stations. TACs can result in health risks associated with exposure to DPMs from diesel vehicles and generators, as well as operational emissions from substances such as chloroform, formaldehyde, benzene, ammonia, and metals. These exposure risks from general implementation of the Program could result in a potentially significant impact. These exposure risks are discussed in further detail below.

CARB has identified DPM from diesel-fueled engines as a TAC, which is typically concentrated around high-volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic, which have the highest associated health risks. Health risks from TACs are a function of both the concentration of emissions and the

duration of exposure. Construction activities have the potential to generate DPM emissions from construction equipment required for activities involving off-road and heavy-duty diesel equipment used for site grading, paving, and activities that are required during construction. Generally, construction of each Program component would be temporary, intermittent, and would occur over a relatively short duration in comparison to the operational lifetime of the wastewater collection system, limiting the potential long-term exposure of receptors to DPM or other TACs. In addition, only select portions of the Program Study Area would be disturbed at any one time, also limiting the potential long-term or repetitive exposure of sensitive receptors. Operation of construction equipment is also regulated by federal, state, and local regulations, including SJVAPCD rules and regulations, which limit the emissions of DPM and TACs in general. However, because the Program has the potential to release TACs, a potentially significant impact could occur prior to mitigation. As such, MM AIR-1 would be required and would implement numerous best management practices (BMPs) reducing potential emissions of DPM and TACs, such as limiting engine idling times, identifying low-emitting equipment, and minimizing equipment use, which would reduce impacts to a less than significant level.

Construction of the new trunk sewer infrastructure would occur linearly, spanning from south Merced to north Merced and from west Merced to east Merced, which would disperse the concentration of any potential emissions, limiting exposure of a sensitive receptor in a specific location for a short period of time (estimated to be a couple weeks maximum in any given location along the pipelines). Notably, the OEHHA provided a recommendation in its 2015 Hotspot Program Guidance not to model construction health risks for construction lasting less than 2 months. Construction of stationary sites such as the pump station associated with the northern trunk sewer and WWTRF lasting for a more than 2 year period on the selected sites could significantly affect nearby receptors. To this point, a small number of rural residential receptors are located adjacent to the Northern Trunk Sewer pump station site and a within the vicinity of the WWTRF site. These receptors could experience health risks associated with emissions of DPM or other TACs generated during construction or operations of the facilities (discussed in more detail below) resulting in a potentially significant impact. MM AIR-3 would require the use of cleaner than average construction equipment at sites requiring longer than 2 months (like the pump station), which would minimize exposure to DPM and would result in a less than significant impact. Therefore, because the construction activities would be temporary, would not be concentrated in any one location, would comply with SJVAPCD rules and regulations as well as federal and state regulations, and would implement MM AIR-3, there would be a less than significant impact of exposing sensitive receptors to TACs with mitigation incorporated.

TACs typical of wastewater treatment facilities can include but are not limited to chloroform from the chlorine disinfection system; DPM from diesel back-up generators and biosolid haul trucks (if required); and VOCs (such as formaldehyde, benzene, ammonia, and metals) from the flare, digester gas boilers, and the headworks. The 2006 Wastewater Treatment Plant Expansion Project DEIR (2006 WWTRF DEIR) for the 20 Mgal/day WWTRF expansion assessed incremental risk of TACs to obtain an estimated total incremental carcinogenic health risk (City of Merced 2006). Using the toxic potency unit risk factor as established by OEHHA, the 2006 WWTRF DEIR determined the maximum carcinogenic risk of the 20 Mgal/day expansion over a 70-year lifetime of exposure to be less than seven cancer cases in a million (City of Merced 2006). This level of risk was (and still is) less that the SJVAPCD's significance threshold of 20 cancer cases per million for a 70-year exposure, and potential impacts resulting from the expansion were anticipated to be less than significant. Since 2006, the WWTRF has been undergoing upgrades to modernize and retrofit treatment processes and equipment as identified in the 2006 WWTRF DEIR, such as replacing the chlorine disinfection system with an ultra-violet light disinfection system to eliminate chloroform emissions;

updating of the candle flare with a sulfur treatment system and match stack controls for greater VOC control efficiency; and construction of an enclosure for the new headworks for decreased release of VOCs with the greatest risk of TAC generation (City of Merced 2006). The WWTRF expansions could introduce new equipment or processes with the potential to exceed the SJVAPCD's significance threshold or the incremental risk of TAC emissions resulting in a potentially significant impact if not properly controlled and designed. In order to ensure that similar VOC-reduction design features are included in the WWTRF expansions, and to reduce the impact to less than significant, MM AIR-4, Design Considerations for Future WWTRF Improvements, would be required. MM AIR-4 would ensure that future design uses Best Available Control Technologies and improvements described above to limit additional TAC emissions to less than significant levels.

Other operational exposure to TACs could occur from DPM at the pump stations and WWTRF associated with back-up diesel generators and biosolids haul trips (if needed). DPM emissions from back-up diesel generators are not anticipated to generate significant DPM emissions due to the back-up nature and limited, intermittent, and short duration uses. Similar to the DPM construction discussion above, the likelihood that any one sensitive receptor would be exposed to high concentrations of DPM for any extended period of time resulting from these haul trips would be low due to the low concentration of vehicles and limited duration of vehicles in any given location. Additionally, as described in the 2006 WWTRF DEIR, improved regulations anticipated 85 percent reductions in DPM emissions associated with diesel engines (City of Merced 2006), which would further limit potential impacts required from any necessary additional trips. Therefore, operational TAC emissions would be less than significant.

With the implementation of MM AIR-3 and MM AIR-4, construction and operation of the Program components and future activities under the Program would result in a less than significant impact from generation of TACs with mitigation incorporated.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Implementation of the Program could temporarily increase traffic volumes on streets within the Program Study Area; and therefore, could increase local CO concentrations. Concentrations of CO approaching the ambient air quality standards are only expected where background levels, traffic volumes, and congestion levels are high, which is not anticipated within the footprints of Program components, but is possible for unspecified future construction within the Program. While construction-related traffic on the local roadways within the Program Study Area would occur during active construction, the net increase of construction workers' vehicle trips to the existing daily traffic volumes in the local roadways would be relatively small and would not result in substantial localized CO emissions. Additionally, the construction-related vehicle trips would only occur during active construction periods and would cease once construction activities have been completed. During operation, a negligible amount of emissions from vehicle trips by worker staff for periodic inspection and maintenance purposes would occur. Therefore, since construction-related traffic from workers and trucks would be minimal and would not substantially increase CO concentrations in the Program Plan Area, and because the CO concentrations associated with the Program would be below SJVAPCD thresholds, localized CO emissions impacts to sensitive receptors would be less than significant.

The placement of pipelines and associated appurtenances for the new trunk sewer infrastructure would largely occur linearly and would not be concentrated in any one location for more than a week. The net increase of construction workers vehicle trips to the existing daily traffic volumes in the local roadways would be relatively small and would not

result in substantial CO emissions, as shown on Table 3.3-6. Operational trips would result in a negligible increase in CO concentrations because these trips would only occur periodically (10 to 20 trips annually) in standard City staff vehicles. Therefore, since construction-related traffic from workers and trucks would be minimal and would not substantially increase CO concentrations in the vicinity of the new trunk sewer infrastructure area, localized CO emissions impacts to sensitive receptors would be less than significant.

Localized concentrations of CO associated with the expansion of the WWTRF would occur during active construction. As shown in Table 3.3-6, CO concentrations for the WWTRF would be below the SJVAPCD thresholds of significance. Additionally, unlike the construction of the pipelines associated with the new trunk sewer infrastructure, the expansion of the WWTRF would consist of construction within the existing property of the WWTRF, and therefore, would have a lower possibility of substantially affecting sensitive receptors surrounding the WWTRF property. Therefore, construction emissions for localized CO would be considered a less than significant impact. Operations at the WWTRF would be similar to existing conditions, with trunks entering and exiting the WWTRF property daily. These operational trips would not constitute a substantial increase in localized CO emissions, and therefore, would result in a less than significant impact.

Conclusion

As discussed above, with implementation of MM AIR-3, and MM AIR-4, the Program and proposed Projects would not cause sensitive receptors to be exposed to substantial pollutant concentrations, including localized CO, TACs, or fugitive dust. Therefore, exposure of sensitive receptors to substantial pollutant concentrations would not occur, and the impact would be less than significant with mitigation incorporated.

Level of Significance Prior to Mitigation: Potentially Significant

Mitigation Required: MM AIR-1, MM AIR-2, MM AIR-3, and MM AIR-4

Level of Significance After Mitigation: Less than Significant with Mitigation

Impact AIR-3 Findings

Impact AIR-3 Overall Level of Significance Prior to Mitigation: Potentially Significant

Impact AIR-3 Mitigation Required: MM AIR-1, MM AIR-2, MM AIR-3, and MM AIR-4

Impact AIR-3 Overall Level of Significance After Mitigation: Less than Significant with Mitigation

Impact AIR-4	**Potential to result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.**

Impact AIR-4 Analysis

Combined Program/Project Impacts

While offensive odors rarely cause any physical harm, they can still be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the SJVAQMD. The occurrence and severity of odor impacts depends on numerous factors, including the nature, frequency, and intensity

of the source, the design and ability for noxious odors to be generated in the first place, the wind speed and direction, and the sensitivity of the receptor. According to the CARB's Air Quality and Land Use Handbook, some of the most common sources of odor complaints received by local air districts are, among others, sewage treatment plants, waste transfer stations, and biomass operations (CARB 2005). The WWTRF, pipelines, and pump stations associated with the Program and proposed Projects are the most likely to emit offensive noxious odors due to the potential for hydrogen sulfides to form during operation of those facilities. Odors associated with construction of the Program and proposed Projects have the most potential to be related to diesel engine operation, similar to the discussion for Impact AIR-3. Odors associated with operation and implementation of the Program and Projects are mostly likely to be associated with sewer conveyance and treatment systems. The following two subsection describe these potential impacts in further detail.

Construction

Diesel fumes from construction equipment are often found to be objectionable; however, operation of diesel equipment on site is short term and intermittent and construction is temporary. Operation of diesel equipment would comply with federal, State, and local regulations, including compliance with all applicable SJVAQMD rules and regulations as part of the construction specifications, which would limit construction-related odorous emissions. As discussed under Impact AIR-3, implementation of the Program would require use of diesel-based equipment. This equipment could result in objectionable emissions of diesel fumes. Diesel odors from construction may be perceived as objectionable in lower concentrations than are required to cause the health risk described in Impact AIR-3. Diesel odor emissions would be temporary and intermittent throughout construction and would follow federal, state, and local regulations, including applicable SJVAPCD rules and regulations. These potential odors would not be anticipated to result in an adverse effect to a substantial number of people because of the duration, anticipated distance of receptors from construction activities, and regulations and equipment that are designed to limit emissions. Further, construction-related fumes and emissions would be spread out over different areas of construction sites, such as the pipeline alignment and would largely occur in areas away from dense concentrations of sensitive receptors (i.e., near agricultural properties and currently undeveloped lands in north and south Merced). Due to the rate of pipeline placement, sensitive receptors along the new trunk sewer pipelines would not be subject to objectionable odors from construction for more than a week. Additionally, the general distance of the majority of Program activities from sensitive receptors is far enough away that the potential for diesel fumes to impact a substantial number of people is extremely low. Therefore, construction-related odor impacts from construction of the Program and proposed Projects would be less than significant.

Operation

As mentioned in Section 3.3.3.1, and in the introduction to Impact AIR-4, operations of conveyance and treatment of wastewater systems can result in objectionable odors due to anoxic conditions creating hydrogen sulfides (and other mercaptans). The SJVAPCD includes screening levels, which are provided in the GAMAQI, for potential odor sources that would be located within 2 miles of sensitive receptors. As indicated in the GAMAQI, if a project would result in sensitive receptors being closer than the screening level distances of 2 miles for a wastewater treatment facility, the impact is presumed to have a less than significant (SJVAPCD 2015). The closest receptor to the WWTRF is less than 2 miles away, thus the presumption does not apply to the Program or Projects.

Odors associated with the operations of the pipelines (at man holes), pump stations, and appurtenances (air release valves) could potentially emit adverse odors that could affect existing or future sensitive receptors along the proposed trunk sewer Projects and future trunk and collector sewer alignments, however, these existing receptors are in limited in number and design controls for the wastewater system eliminate much of the potential for substantial exposure. Air release valves and other pressure-release features, which would release air from the wastewater pipes, are anticipated to prevent air binding in the pipes and to protect the pipes from collapse as well as generation of noxious odors. The air valves would be outfitted with odor control features like carbon canisters or odor scrubbers that would be replaced on a bi-annual basis to prevent the escape of hydrogen sulfide at air valve locations, which would limit odor emissions. Odor control measures would be maintained (estimated to be replaced pursuant to specifications approximately bi-annually) and would also be consistent with the current operations of the wastewater collection system.

The proposed Northern Trunk Sewer pump station and much of the Program would be designed to be scalable adding capacity only as needed which would prevent anerobic conditions within the wet well that would result in the emission of hydrogen sulfides (and other mercaptans). Similarly, future trunk sewer and collector pipelines would be designed in a way to maintain appropriate flows and limit the potential for creation of hydrogen sulfides (and other mercaptans) that could potentially emit odors through manholes. Therefore, with standard odor control and design techniques implemented for sewer systems, and with regular maintenance of any of these odor control facilities, impacts related to odor from the pipeline operations would be less than significant.

At the WWTRF, the distance and topography from sensitive receptors and design features currently present, have successfully contained odors and no formal odor complaints have been received as of mid-2020. Although the WWTRF is located within 2 miles of sensitive receptors, the WWTRF would continue to factor odor control into design and include further odor control reduction methods as it is expanded. Odor controls such as, improved ventilation and filtering technologies, closed-loop filtration systems, and the land buffers surrounding the WWTRF would further buffer potential odors around the site. The WWTRF expansions would be consistent with the current operations and would not exacerbate odors for any nearby sensitive receptors. Additionally, the operations of the WWTRF currently apply biosolids to the agricultural land adjacent to the WWTRF property. No odor complaints have been received regarding the application of these biosolids due to the digested nature of these materials. If application of additional biosolids would occur at the WWTRF, these additional biosolids would be digested in a similar manner and would not increase the odors at the WWTRF. Therefore, odor impacts from the upgrades to the WWTRF would be considered less than significant.

Level of Significance Prior to Mitigation: Less than Significant

Mitigation Required: None Required

Level of Significance After Mitigation: Less than Significant

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Impact AIR-4 Findings

Impact AIR-4 Overall Level of Significance Prior to Mitigation: Less than Significant

Impact AIR-4 Mitigation Required: None Required

Impact AIR-4 Overall Level of Significance After Mitigation: Less than Significant

3.3.5 Air Quality Mitigation Measures

Mitigation Measure AIR-1: Pre-Construction Worker Environmental Awareness Program (Air Quality)

The purpose of a Worker Environmental Awareness Program (WEAP) is to educate personnel (i.e., construction workers) about the existing onsite and surrounding resources and the measures required to protect these resources as well as avoidance and potential hazards within these sites. The WEAP, developed by the City, shall include materials and information on potentially sensitive biological and cultural resources, air quality protection measures, potential hazards resulting from construction within the Program Study Area, and applicable precautions personnel should take to reduce potential impacts.

The WEAP presentation shall be given to all personnel who may be exposed to site hazards or may harm sensitive environmental resources as identified within the WEAP mitigation measures (i.e., prolonged exposure to noise levels over 85 decibels [like operation of a bulldozer at 50 feet], exposure to dust generating or ground disturbing activities, work in non-biologically cleared areas, and equipment operators who may encounter sensitive species). The WEAP presentation shall be given prior to the start of construction and as necessary throughout the life of the Program and proposed Projects as new personnel arrive onsite. The City and the contractor are responsible for ensuring that all onsite personnel attend the WEAP presentation, receive a summary handout, and sign a training attendance acknowledgement form to indicate that the contents of the presentation are understood and to provide proof of attendance. Each participant of the WEAP presentation shall be responsible for maintaining their copy of the WEAP reference materials and for making sure that other onsite personnel are complying with the recommended precautions. The contractor shall keep the WEAP sign-in sheet onsite and submit copies of the sign-in sheet to the City's Project Manager, who shall keep it on file at City offices.

For the air quality and hazardous materials portion of the WEAP presentation, the following information and implementation steps shall be prepared, presented, and executed prior to and during construction or earth-moving activities to prevent exposure and raise awareness of potential air quality and hazard impacts:

- Inform personnel about potential hazards within the Program Study Area, including but not limited to both naturally occurring and asbestos-containing materials present within soils as well as Valley Fever spores (*Coccidioides immitis*) and the likelihood of presence within specific project sites. Information given should include the following:
    - Providing context as to where these hazards could occur during construction.
    - Outlining ways to prevent exposure (outlined below).
    - Informing personnel that the appropriate respiratory equipment can be provided upon request to further prevent exposure to dust particles.
    - Informing personnel about the symptoms of exposure to potential hazards, including to asbestos and Valley Fever exposure. Symptoms of Valley Fever exposure could include but are not limited to fever, cough, chills, and night sweats which appear 1 to 3 weeks after exposure. Symptoms of asbestos exposure

(i.e., Asbestosis) occur over a much longer period of time (10 to 40 years after exposure) and could include but are not limited to shortness of breath, tightness in chest, chest pain, and appetite loss.

- Informing personnel about appropriate actions to take if symptoms of exposure occur including regular doctor checkups (i.e., for personnel working regularly within the construction or industrial settings where exposure to asbestos is high) and seeking emergency medical care if symptoms for Valley Fever persist or get worse.

Mitigation Measure AIR-1 Implementation

Responsible Party: The City and contractor

Timing: Prior to construction and throughout construction activities as new personnel arrive on the specific project site

Monitoring and Reporting Program: Development of a WEAP presentation and handout packet in accordance with this mitigation measure and any other resource specific WEAP requirements. A sign-in sheet completed for all workers on the construction site shall be kept on file at the specific project sites, and copies shall be submitted to the City's Project Manager to be kept on file at City offices.

Standards for Success: Limit exposure of personnel to potential air quality hazards during construction through prescribed safety precautions. If exposure cannot be avoided, education of personnel for immediate recognition of health symptoms to act quickly and seek appropriate medical or emergency care to limit long-term harm.

Mitigation Measure AIR-2: Implement Hazardous Materials Measures

The City or chosen contractor shall retain a professional geologist or geotechnical engineer who shall perform historic database searches for both naturally occurring asbestos and likelihood of asbestos-containing materials in the Program Study Area. If the professional geologist or geotechnical engineer determines further site-specific analysis is warranted, they shall conduct additional geologic evaluations of specific project sites to determine the presence or absence of naturally-occurring asbestos or asbestos-containing materials onsite. These evaluations shall include the specific Project sites (i.e., the pipeline alignments and pump station locations) and any additional staging areas that will be used. These evaluations shall be completed and submitted to the San Joaquin Valley Air Pollution Control District (SJVAPCD) at least 60 days prior to the start of construction. If naturally-occurring asbestos or asbestos-containing materials are discovered onsite, the following measures shall be implemented:

- The City or chosen contractor shall prepare an Asbestos Dust Migration Plan pursuant to California Code of Regulations (CCR) Title 17 Section 9035, Asbestos Toxic Control Measures for Construction, Grading, Quarrying, and Surface Mining Operations, and shall obtain approval by the SJVAPCD. The Plan shall include all measures required by the State of California and the SJVAPCD.
- If asbestos is found in concentrations greater than 5 percent, the material shall not be used as surface material as stated in CCR Title 17 Section 93106, Asbestos Airborne Toxic Control Measure-Asbestos Containing Serpentine. The material with naturally-occurring asbestos can be reused at the site for subgrade material covered by other non-asbestos-containing material.

Mitigation Measure AIR-2 Implementation

Responsible Party: The City and contractor

Timing: The construction emissions minimization measures shall be included in all construction contracts, and individual contractors shall agree to the required measures and reporting requirements in order to obtain payment for services.

Monitoring and Reporting Program: The individual construction contractors shall prepare monitoring reports at the end of each construction phase and provide those to the City within 10 business days of completion of each phase.

Standards for Success: Construction exhaust emissions impacts are reduced to a less than significant level.

Mitigation Measure AIR-3: Minimize Construction Emissions

The City shall require that construction contracts for the Program and proposed Projects include but not be limited to the following measures to reduce construction emissions:

- Contractor reporting requirements:
    - Contractors shall provide an equipment inventory, which shall include estimates of the construction timeline by phase with descriptions of each piece of off-road equipment required for each phase.
    - Contractors shall use cleaner than average off-road equipment (generally Tier 2 or higher) that will achieve a minimum of 20 percent reduction in nitrogen oxides and 45 percent reduction in exhaust of particulate matter less than 10 microns in diameter.
    - Contractors shall provide reporting for each construction phase within 10 business days of completion of each phase. The report shall include the equipment type, engine model year, equipment horsepower, total hours of operation, fuel type, any control devices, and the quantity of equipment. The report shall be submitted to the City of Merced and may be used for the City's compliance with SJVAPCD Rule 9510.
- Fuel efficiency requirements:
    - Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 3-minutes (5-minute limit is required by the State airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site.
    - Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
    - Train equipment operators in proper use of equipment.
    - Use the proper size of equipment for the job.
    - Use equipment with new technologies (repowered engines, electric drive trains).
    - Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.

- Where construction is anticipated to occur for a period longer than 2 months and is located within 1,000 feet of sensitive receptors, the following clean construction equipment measure shall apply:
    - Use Tier 2 or higher engines and the most effective Verified Diesel Emission Control Strategies (Tier 4 engines automatically meet this requirement) for the engine type as certified by the California Air Resources Board for equipment 100 horsepower or greater and used more than 20 hours for the duration of construction.

Mitigation Measure AIR-3 Implementation

Responsible Party: The City and contractor

Timing: The construction emissions minimization measures shall be included in all construction contracts, and individual contractors shall agree to the required measures and reporting requirements to obtain payment for services.

Monitoring and Reporting Program: The individual construction contractors shall prepare monitoring reports at the end of each construction phase and shall provide those to the City within 10 business days of completion of each phase.

Standards for Success: Limit emissions of DPM from construction.

Mitigation Measure AIR-4: Design Considerations for Future WWTRF Improvements

Future expansions at the Wastewater Treatment and Reclamation Facility (WWTRF) shall be designed to incorporate toxic air contaminant (TAC)-reducing technologies to reduce emissions from TAC sources such as chloroform and volatile organic compounds (VOCs). This could include the use of Best Available Control Technologies at the time of design or shall incorporate the following to reduce operational TAC emissions at the WWTRF:

- Adding candle flares with an enclosed flare that would result in a taller emission source with a greater VOC control efficiency.
- Incorporating an ultra-violet light disinfection system for any future expansions in place of existing chlorine disinfection systems that would eliminate chloroform emissions.
- Enclose headworks to decrease the release of VOCs.

Mitigation Measure AIR-4 Implementation

Responsible Party: The City

Timing: Incorporation of TAC reduction features shall occur during the design phase of each WWTRF expansion. Implementation of the TAC reduction features shall occur during design of the WWTRF expansions.

Monitoring and Reporting Program: The City shall ensure that the appropriate design features are implemented during the design phase of the WWTRF expansions.

Standards for Success: TAC emissions impacts from the WWTRF expansions shall be reduced below the SJVAPCD's most recent TAC thresholds.

3.3.6 Abbreviations

APCO	Air Pollution Control Officer
AQP	Air Quality Plan
BACT	Best Available Control Technologies
BMP	Best Management Practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimate Model
CARB	California Air Resources Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
City	City of Merced
CO	Carbon Monoxide
C2H3Cl	Vinyl Chloride
DPM	Diesel Particulate Matter
EIR	Environmental Impact Report
GAMAQI	Guidance for Assessing and Mitigating Air Quality Impacts
H2S	Hydrogen Sulfide
ISR	Indirect Source Review
Mgal/d	Million Gallons Per Day
mg/m3	Milligrams per cubic meter
MMs	Mitigation Measures
NAAQS	National Ambient Air Quality Standards
NO	Nitric Oxide
NOP	Notice of Preparation
NO2	Nitrogen Dioxide
NOx	Nitrogen Oxides
OEHHA	Office of Environmental Health Hazards Assessment
Pb	Lead
PM	Particulate Matter
PPM	Parts Per Million
ROG	Reactive Organic Gases
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SOC	Statement of Overriding Considerations

SO2	Sulfur Dioxide
SUDP/SOI	Specific Urban Development Plan/Sphere of Influence
TAC	Toxic Air Contaminant
USEPA	United States Environmental Protection Agency
VDE	Visible Dust Emissions
VOC	Volatile Organic Compounds
WEAP	Worker Environmental Awareness Program
WWTRF	Wastewater Treatment and Reclamation Facility
µg/m3	Microgram per cubic meter
2030 General Plan	Merced Vision 2030 General Plan
°F	Degrees Fahrenheit

3.3.7 References

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