3.2 Air Quality

This supplemental environmental impact report (SEIR) addresses proposed modifications to the B.F. Sisk Dam Safety of Dams Modification Project, which was previously evaluated in the B.F. Sisk Dam Safety of Dams Modification Project Environmental Impact Statement/Environmental Impact Report (2019 EIS/EIR). The project addressed in the 2019 EIS/EIR is referred to herein as the Approved Project; the Approved Project with proposed modifications identified since certification of the 2019 EIS/EIR is referred to herein as the Modified Project.

This section describes the existing air quality conditions of the Modified Project site and vicinity, identifies associated regulatory requirements, evaluates potential impacts, and identifies any applicable mitigation measures related to implementation of the Modified Project.

3.2.1 Existing Conditions

3.2.1.1 Meteorological and Topographical Conditions

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions also are important. Factors such as wind speed and direction, air temperature gradients and sunlight, and precipitation and humidity interact with physical landscape features to determine the movement and dispersal of criteria air pollutants. These factors are described below.

Topography

The Modified Project site is within the San Joaquin Valley Air Basin (SJVAB),[1] which consists of eight counties and is spread across 25,000 square miles of Central California. The SJVAB is bordered on the east by the Sierra Nevada (8,000 to 14,491 feet in elevation), on the west by the Coast Ranges (averaging 3,000 feet in elevation), and to the south by the Tehachapi Mountains (6,000 to 7,981 feet in elevation). The San Joaquin Valley comprises the southern half of California's Central Valley, is approximately 250 miles long, and averages 35 miles wide, with a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the San Joaquin Valley opens to the San Francisco Bay at the Carquinez Strait. At its northern end is the Sacramento Valley, which comprises the northern half of the Central Valley. The region's topographic features restrict air movement through and out of the SJVAB. As a result, the SJVAB is highly susceptible to pollutant accumulation over time.

Climate

The San Joaquin Valley is in a Mediterranean Climate Zone, influenced by a subtropical high-pressure cell most of the year and characterized by warm, dry summers and cooler winters. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in winter. Summertime maximum temperatures in the San Joaquin Valley often exceed 100°F.

1 Descriptions of climate and topography are based on Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015a).

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

Wind Patterns

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

Two significant diurnal wind cycles that occur frequently in the San Joaquin Valley are the sea breeze and mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the San Joaquin Valley. In the mountains during periods of weak synoptic scale winds, winds tend to be upslope during the day and downslope at night. Nighttime and drainage flows are pronounced during the winter when flow from the easterly direction is enhanced by nighttime cooling in the Sierra Nevada. Eddies can form in the valley wind flow and can re-circulate a polluted air mass for an extended period.

Temperature, Sunlight, and Ozone Production

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

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

Precipitation, Humidity, and Fog

Precipitation and fog can result in the reduction or increase in some pollutant concentrations. For instance, O_3 needs sunlight for its formation, and clouds and fog can block the required solar radiation. In addition, wet fogs can cleanse the air during winter as moisture collects on particles and deposits them on the ground. Fog with less moisture content, however, can contribute to the formation of secondary ammonium nitrate particulate matter.

The winds and unstable air conditions experienced during the passage of winter storms result in periods of low pollutant concentrations. Between winter storms, high pressure and light winds allow cold, moist air to pool on the San Joaquin Valley floor, resulting in strong low-level temperature inversions and very stable air conditions, which can lead to Tule fog. Wintertime conditions favorable to fog formation are also conditions favorable to high concentrations of particulate matter.

3.2.1.2 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter equal to or less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$), and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs.[2] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly NO_x and ROGs (also referred to as volatile organic compounds [VOCs]). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere (stratospheric O_3) and at Earth's surface in the lower atmosphere (tropospheric O_3).[3] The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). Inhalation of O_3 causes

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2 The descriptions of the criteria air pollutants and associated health effects are based on the U.S. Environmental Protection Agency's "Criteria Air Pollutants" (EPA 2018a) and the California Air Resources Board's (CARB) "Glossary" (CARB 2019a), and CARB's "Fact Sheet: Air Pollution Sources, Effects and Control" (CARB 2009).

3 The troposphere is the layer of Earth's atmosphere nearest to the surface of Earth, extending outward approximately 5 miles at the poles and approximately 10 miles at the equator.

inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms. Exposure to O_3 can reduce the volume of air that the lungs breathe in and cause shortness of breath. O_3 in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. The occurrence and severity of health effects from O_3 exposure vary widely among individuals, even when the dose and the duration of exposure are the same. Research shows adults and children who spend more time outdoors participating in vigorous physical activities are at greater risk from the harmful health effects of O_3 exposure. While there are relatively few studies of O_3's effects on children, the available studies show that children are no more or less likely to suffer harmful effects than adults. However, there are a number of reasons why children may be more susceptible to O_3 and other pollutants. Children and teens spend nearly twice as much time outdoors and engaged in vigorous activities as adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults. Also, children are less likely than adults to notice their own symptoms and avoid harmful exposures. Further research may be able to better distinguish between health effects in children and adults. Children, adolescents and adults who exercise or work outdoors, where O_3 concentrations are the highest, are at the greatest risk of harm from this pollutant (CARB 2019b).

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x, which includes NO_2 and nitric oxide, plays a major role, together with ROG, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_2 is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources (such as electric utility and industrial boilers).

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the ambient air quality standards for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher compared to lower levels of exposure. In addition, children with asthma have a greater degree of airway responsiveness compared with adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB 2019c).

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

CO is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion and reduced mental alertness, and light-headedness and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Unborn babies, infants, older adults, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB 2019d).

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

Controlled human exposure and epidemiological studies show that children and adults with asthma are more likely to experience adverse responses with SO_2 exposure, compared with the non-asthmatic population. Effects at levels near the 1-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity. Also, exposure at elevated levels of SO_2 (above 1 part per million) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. Older adults and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects (CARB 2019e).

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in particulate matter (NRC 2005). People with asthma are of particular concern because they have increased baseline airflow resistance and because their SO_2-induced increase in resistance is greater than that seen in healthy people, and it increases with the severity of their asthma (NRC 2005). SO_2 is thought to induce airway constriction via neural reflexes involving irritant receptors in the airways (NRC 2005).

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

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. PM_{10} tends to collect in the upper portion of the respiratory system, whereas $PM_{2.5}$ is small enough to penetrate deeper into the lungs and damage lung tissue. Suspended particulates also produce haze and reduce regional visibility and damage and discolor surfaces on which they settle.

A number of adverse health effects have been associated with exposure to $PM_{2.5}$ and PM_{10}. For $PM_{2.5}$, short-term exposures (up to 24 hours) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases. In addition, of all of the common air pollutants, $PM_{2.5}$ is associated with the greatest proportion of adverse health effects related to air pollution, both in the United States and worldwide, based on the World Health Organization's Global Burden of Disease Project. Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB 2017).

Long-term (months to years) exposure to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM_{10} are less clear, although several studies suggest a link between long-term PM_{10} exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer (CARB 2017).

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

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

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

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

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

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

Reactive Organic Gases. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to the formation of O_3 are referred to and regulated as ROGs. Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of ROGs result from the formation of O_3 and its related health effects. High levels of ROGs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for ROGs as a group.

3.2.1.3 Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics “Hot Spots” Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

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

Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair) and thus is a subset of $PM_{2.5}$ (CARB 2019f). DPM is typically composed of carbon particles (“soot,” also called black carbon) and numerous organic compounds, including more than 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2019f). CARB classified “particulate emissions from diesel-fueled engines” (i.e., DPM; 17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines, including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB

2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same noncancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2019f). Those most vulnerable to noncancer health effects are children, whose lungs are still developing, and older adults, who often have chronic health problems.

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

Valley Fever. Coccidioidomycosis, more commonly known as "Valley Fever," is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. The spores can be found in some areas naturally occurring in soils, can become airborne when the soil is disturbed, and can subsequently be inhaled into the lungs. Valley Fever symptoms occur within 2 to 3 weeks of exposure. Approximately 60% of Valley Fever cases are mild and display flu-like symptoms or no symptoms at all. The fungus is prevalent in the soils of the San Joaquin Valley, including in Merced County. In 2018, Merced County had an incidence rate of 48.3 cases annually of Valley Fever per 100,000 people (CDPH 2018). *Coccidioides* is thought to grow best in soil after heavy rainfall and then disperse into the air most effectively during hot, dry conditions.

3.2.1.4 Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to an emissions source, or duration of exposure to air pollutants. The San Joaquin Valley Air Pollution Control District (SJVAPCD) considers hospitals, schools, parks, playgrounds, daycare centers, nursing homes, convalescent facilities, and residential areas as sensitive receptor land uses (SJVAPCD 2015a).

The nearest point of construction activities to the closest sensitive receptors (i.e., residential subdivision to the east) for the proposed changes in borrow areas would be approximately 11,630 feet from Borrow Area 12 and approximately 10,700 feet from Borrow Area 14. The nearest point of construction activities to the closest sensitive receptors (i.e., residences east of O'Neill Forebay) for the proposed campground construction would be approximately 10,900 feet. The nearest point of construction activities to the closest sensitive receptors (i.e., residence at Harper Lane south of Basalt Hill Borrow Area) for the proposed minor additions to contractor work area would be approximately 14,300 feet.

3.2.1.5 Existing Air Quality

Under both the federal and state Clean Air Acts (described in Section 3.2.2), standards identifying the maximum allowable concentration of criteria air pollutants have been adopted. The EPA and CARB use air quality monitoring data to determine if each air basin or county is in compliance with the applicable standards. If the concentration of a criteria air pollutant is lower than the standard or not monitored in an area, the area is classified as attainment or unclassified (unclassified areas are treated as attainment areas). If an area exceeds the standard, the area is classified as nonattainment for that pollutant.

The EPA has designated the SJVAB as a nonattainment area for the federal 8-hour O_3 standard, and CARB has designated the SJVAB as a nonattainment area for the state 1-hour and 8-hour O_3 standards. The SJVAB has also been designated as a nonattainment area for the state PM_{10} standard and for the federal and state $PM_{2.5}$ standards. The SJVAB is designated as unclassified or attainment for the other criteria air pollutants. The status of the SJVAB with respect to the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) is summarized in Table 3.2-1.

Table 3.2-1. San Joaquin Valley Air Basin Attainment Status (Merced County)

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

Sources: CARB 2019g; EPA 2020a; SJVAPCD n.d.

Notes: Attainment = meets the standards; Attainment (maintenance) = achieve the standards after a nonattainment designation; Nonattainment = does not meet the standards; Unclassified or unclassifiable = insufficient data to classify; Unclassifiable/attainment = meets the standard or is expected to meet the standard despite a lack of monitoring data.

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

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

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

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

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

Under authority and oversight from the EPA pursuant to Title 40 Code of Federal Regulations Part 58, the SJVAPCD and CARB maintain ambient air quality monitoring stations throughout the SJVAB. In addition, the SJVAPCD gathers air quality data from a variety of monitoring sites from other contracted agencies (e.g., U.S. Marine Corps). Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Not all air pollutants are monitored at each station; thus, data are summarized from the closest representative station that monitors a specific pollutant.

The closest ambient air quality monitoring station to the Modified Project site that monitors O_3, PM_{10}, $PM_{2.5}$, and NO_2 is located at 1034 South Minaret Street, Turlock, California 95380, approximately 30 miles northeast of the Modified Project site. The closest monitoring station for CO is the monitoring station at 814 14th Street, Modesto, California 95354, approximately 40 miles to the north. The data collected at these stations are considered generally representative of the air quality experienced in the Modified Project vicinity. The most recent background ambient air quality data from 2017 to 2019 and the number of days exceeding the ambient air quality standards are presented in Table 3.3-2.

Table 3.2-2. Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2017	*2018*	*2019*	*2017*	*2018*	*2019*
Ozone (O_3) – Turlock Station									
Maximum 1-hour Concentration	ppm	State	0.09	0.114	0.108	0.090	3	7	0
Maximum 8-hour Concentration	ppm	State	0.070	0.100	0.096	0.083	31	28	13
		Federal	0.070	0.099	0.095	0.082	31	26	13
Nitrogen Dioxide (NO_2) – Turlock Station									
Maximum 1-hour Concentration	ppm	State	0.18	0.058	0.067	0.059	0	0	0
		Federal	0.100	0.059	0.067	0.059	0	0	0
Annual Concentration	ppm	State	0.030	0.009	0.009	0.008	0	0	0
		Federal	0.053	0.010	0.010	0.009	0	0	0
Carbon Monoxide (CO) – Modesto Station									
Maximum 1-hour Concentration	ppm	State	20	2	2.7	1.8	0	0	0
		Federal	35	2	2.7	1.8	0	0	0
Maximum 8-hour Concentration	ppm	State	9.0	1.6	2.1	1.3	0	0	0
		Federal	9	1.6	2.1	1.3	0	0	0
Coarse Particulate Matter (PM_{10})[a] – Turlock Station									
Maximum 24-hour Concentration	μg/m³	State	50	109.4	250.4	98.4	91.8 (15)	79.6 (13)	60.5 (10)
		Federal	150	111.7	238.7	95.9	0.0 (0)	6.1 (1)	0.0 (0)
Annual Concentration	μg/m³	State	20	36.9	37.5	30.6	—	—	—
Fine Particulate Matter ($PM_{2.5}$)[a] – Turlock Station									
Maximum 24-hour Concentration	μg/m³	Federal	35	72.3	187.3	40.7	29.2 (29)	25.7 (25)	8.3 (8)
Annual Concentration	μg/m³	State	12	12.7	17.2	10.6	—	—	—
		Federal	12.0	12.7	17.2	10.6	—	—	—

Sources: CARB 2020; EPA 2020b.
Notes: — = not available; μg/m3 = micrograms per cubic meter; ND = insufficient data available to determine the value; ppm = parts per million

Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of federal and state standards are only shown for O3, particulate matter, and CO. Daily exceedances for particulate matter are estimated days because PM10 and PM2.5 are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour O3, annual PM10, or 24-hour SO2, nor is there a state 24-hour standard for PM2.5.

[a] Measurements of PM10 and PM2.5 are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

3.2.2 Relevant Plans, Policies, and Ordinances

3.2.2.1 Federal

Criteria Air Pollutants

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

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

Hazardous Air Pollutants

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

3.2.2.2 State

Criteria Air Pollutants

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

CARB has established the CAAQS, which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions, that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 3.2-3.

Table 3.2-3. Ambient Air Quality Standards

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

Table 3.2-3. Ambient Air Quality Standards

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

Source: CARB 2016.

Notes: O_3 = ozone; ppm = parts per million by volume; µg/m^3 = micrograms per cubic meter; NO_2 = nitrogen dioxide; CO = carbon monoxide; mg/m^3= milligrams per cubic meter; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; PST = Pacific Standard Time.

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter (PM_{10}, $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

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

d National primary standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

e National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

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

g To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

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

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

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

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

Toxic Air Contaminants

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

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

California Health and Safety Code Section 41700

Section 41700 of the California Health and Safety Code states that a person must not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. Section 41700 also applies to sources of objectionable odors.

3.2.2.3 Local

San Joaquin Valley Air Pollution Control District

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

Air Quality Plans

The SJVAPCD has prepared several air quality attainment plans to achieve the O_3 and particulate matter standards, the most recent of which include the 2020 Reasonably Available Control Technology Demonstration for the 2015 8-Hour Ozone Standard (2020 RACT Demonstration) (SJVAPCD 2020), 2016 Plan for the 2008 8-Hour Ozone Standard (SJVAPCD 2016a), 2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan (SJVAPCD 2014a), 2013 Plan for the Revoked 1-Hour Ozone Standard (SJVAPCD 2013), 2007 PM_{10} Maintenance Plan and Request for Redesignation (SJVAPCD 2007), 2012 $PM_{2.5}$ Plan (SJVAPCD 2012), 2015 Plan for the 1997 $PM_{2.5}$ Standard (SJVAPCD 2015b), 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard (SJVAPCD 2016b), and the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards (SJVAPCD 2018). Brief summaries for the most recent plans are provided below.

2020 Reasonably Available Control Technology Demonstration for the 2015 8-Hour Ozone Standard

The SJVAPCD adopted the 2020 RACT Demonstration on June 18, 2020. The San Joaquin Valley is classified as an extreme nonattainment area for the 2015 O_3 standard. The 2020 RACT Demonstration includes a comprehensive evaluation of all NO_x and ROG SJVAPCD rules to ensure that each rule meets or exceeds Reasonably Available Control Technology. The 2020 RACT Demonstration fulfills Clean Air Act requirements and demonstrates that all federal Reasonably Available Control Technology requirements continue to be satisfied in the San Joaquin Valley.

SJVAPCD 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards

The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards on November 15, 2018. This plan addresses the EPA federal 1997 annual $PM_{2.5}$ standard of 15 micrograms per cubic meter ($\mu g/m^3$) and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$, the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$, and the 2012 annual $PM_{2.5}$ standard of 12 $\mu g/m^3$. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable.

Applicable Rules

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

Notwithstanding nonexempt stationary sources, which would be permitted on a case-by-case basis, SJVAPCD Regulations IV, VIII and IX generally apply to land use development projects and are listed below:

- Regulation IV – Prohibitions
  - Rule 4102: Nuisance
  - Rule 4601: Architectural Coatings
  - Rule 4641: Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations
- Regulation VIII – Fugitive PM_{10} Prohibition
  - Rule 8021: Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities
  - Rule 8031: Bulk Materials
  - Rule 8041: Carryout and Trackout
  - Rule 8051: Open Areas
  - Rule 8061: Paved and Unpaved Roads
  - Rule 8071: Unpaved Vehicle/Equipment Traffic Areas
- Regulation IX – Mobile and Indirect Sources
  - Rule 9110: General Conformity
  - Rule 9120: Transportation Conformity

- Rule 9410: Employer Based Trip Reduction
- Rule 9510: Indirect Source Review (ISR)
- Rule 9610: State Implementation Plan Credit for Emission Reductions Generated through Incentive Programs

Pursuant to Rule 8021, Section 6.3, the Modified Project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan to reduce fugitive dust impacts during Modified Project construction.

Merced County Association of Governments

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

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

Merced Vision 2030 General Plan

As required by state law, Merced County has adopted a general plan to guide land use decisions within the county. The general plan provides goals, policies, standards, and implementation programs to guide the physical development of a county. At a minimum, the general plan must address the topics of land use, transportation, housing, conservation, open space, noise, and safety. The Merced Vision 2030 General Plan (Merced County General Plan), adopted in 2013, has established the year 2030 as the plan's time horizon. The Air Quality Element of the Merced County General Plan is intended to protect public health and welfare by implementing measures that allow the SJVAPCD to attain federal and state air quality standards (Merced County 2013). The Air Quality Element sets forth a number of policies and standards to reduce current pollutant emissions and to require new development to include measures to comply with air quality standards. The following goal and policies would apply to the Modified Project (Merced County 2013):

Air Quality Element

Goal AQ-6: Improve air quality in Merced County by reducing emissions of PM_{10}, $PM_{2.5}$, and other particulates from mobile and non-mobile sources.

- **Policy AQ-6.1: Particulate Emissions from Construction.** Support the SJVAPCD's efforts to reduce particulate emissions from construction, grading, excavation, and demolition to the maximum extent feasible and consistent with State and Federal regulations.
- **Policy AQ-6.2: Emissions from County Roads.** Require PM_{10} and $PM_{2.5}$ emission reductions on County-maintained roads to the maximum extent feasible and consistent with State and Federal regulations.
- **Policy AQ-6.3: Paving Materials.** Require all access roads, driveways, and parking areas serving new commercial and industrial development to be constructed with materials that minimize particulate emissions and are appropriate to the scale and intensity of use.
- **Policy AQ-6.8: Voluntary Emissions Reduction Agreement.** Require all project applicants, where project emissions for any criteria pollutant have been evaluated to exceed SJVAPCD significance thresholds, to consult with the SJVAPCD regarding the establishment of a Voluntary Emissions Reduction Agreement between the applicant and the SJVAPCD. Support the SJVAPCD in its efforts to fund the Emission Reduction Incentive Program.

3.2.3 Thresholds of Significance

The following significance criteria from the 2019 EIS/EIR are used for the purpose of analysis in this SEIR. These criteria, which have not changed from the 2019 EIS/EIR, are identified in Chapter 7, Air Quality, of the 2019 EIS/EIR. A significant impact related to air quality would occur if the Modified Project would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard.
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the area of analysis is nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone [O_3] precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

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

SJVAPCD Thresholds

Criteria Air Pollutants

The SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts has established emissions-based thresholds of significance for criteria pollutants (SJVAPCD 2015a), which are identified in Table 3.2-4. As shown in Table 3.2-4, the SJVAPCD has established significance thresholds for construction emissions and operational permitted and non-permitted equipment and activities. The Guidance for Assessing and Mitigating Air Quality Impacts recommends evaluating impact significance for each of these categories of emissions separately.

Table 3.2-4. SJVAPCD CEQA Significance Thresholds for Criteria Pollutants

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

Source: SJVAPCD 2015a.
Note: ROG = reactive organic gas; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.

In addition to the annual emissions mass thresholds described in Table 3.2-4, the SJVAPCD has also established screening criteria to determine whether a project would result in a CO hotspot at affected roadway intersections (SJVAPCD 2015a). If neither of the following criteria is met at any of the intersections affected by the Modified Project, the Modified Project would result in no potential to create a violation of the CO standard:

- A traffic study for the Modified Project indicates that the level of service (LOS) on one or more streets or at one or more intersections in the Modified Project site will be reduced to LOS E or F.
- A traffic study indicates that the Modified Project will substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the Modified Project site.

Ambient Air Quality Impacts

Appendix G of the State of California CEQA Guidelines (CEQA Guidelines) indicates that a project would have a significant air quality impact if it would violate any air quality standard or contribute substantially to an existing or projected air quality violation. The thresholds of significance for ambient air quality are based on the CAAQS and NAAQS, whereby a project would be considered to have a significant impact if its emissions are predicted to cause or contribute to a violation of an ambient air quality standard by exceeding any CAAQS or NAAQS (SJVAPCD 2015a). The Guidance for Assessing and Mitigating Air Quality Impacts recommends performing an ambient air quality analysis if a project would generate criteria air pollutant emissions from on-site sources that exceed 100 pounds per day (SJVAPCD 2015a). The ambient air quality assessment includes air quality dispersion modeling to determine air pollutant concentrations, which are added to the corresponding background levels of pollutant concentrations and compared to the relevant CAAQS and/or NAAQS. If the sum of air pollutant concentrations and background pollutant levels is modeled to exceed a CAAQS or NAAQS, SJVAPCD recommends that specified significant impact levels be applied to the modeled concentrations to assess whether a project's emissions would contribute substantially to an existing violation of the CAAQS or NAAQS (SJVAPCD 2014b).

Toxic Air Contaminants

The SJVAPCD has established thresholds of significance for combined TAC emissions from the operations of both permitted and non-permitted sources (SJVAPCD 2015a). Projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the maximally exposed individual equals or exceeds 20 in 1 million people[4]
- Hazard Index[5] for acute and chronic non-carcinogenic TACs equals or exceeds 1 for the maximally exposed individual

Odors

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

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

The SJVAPCD has identified some common types of facilities that have been known to produce substantial odors, as well as screening distances between these odor sources and receptors. These are depicted in Table 3.2-5.

Table 3.2-5. Screening Levels for Potential Odor Sources

Type of Facility	Screening Distance (Miles)
Wastewater Treatment Facility	2
Sanitary Landfill	1
Transfer Station	1
Composting Facility	1
Petroleum Facility	2
Asphalt Batch Plant	1
Chemical Manufacturing	1
Fiberglass Manufacturing	1
Painting/Coating (i.e., auto body shop)	1

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

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

Table 3.2-5. Screening Levels for Potential Odor Sources

Type of Facility	Screening Distance (Miles)
Food Processing Facility	1
Feed Lot/Dairy	1
Rendering Plant	1

Source: SJVAPCD 2015a.

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

- More than one confirmed complaint per year averaged over a 3-year period.
- Three unconfirmed complaints[6] per year averaged over a 3-year period.

Cumulative

A project's emissions may be individually limited but cumulatively considerable when taken in combination with past, present, and future development within the SJVAB. If a project would result in a significant impact based on the SJVAPCD annual thresholds of significance for criteria pollutants, then the project would also be considered cumulatively significant. However, if the project emissions are below the annual significance thresholds for criteria pollutants, the impact may still be cumulatively significant. For instance, if the project results in criteria pollutant concentrations that exceed any of the federal health-based ambient air concentration standards or causes a worsening of areas already exceeding those standards, the project's impacts would be considered individually significant and cumulatively significant. In addition, the combined emissions of the project and cumulative development located within the same area could potentially cause or worsen an exceedance of the concentration standards, whereby the project would have a cumulatively significant impact (SJVAPCD 2015a).

In regard to TACs, because impacts are localized and the SJVAPCD thresholds of significance for TACs have been established at an extremely conservative level, risks that equal or exceed the individual thresholds of significance are also considered cumulatively significant (SJVAPCD 2015a). No other cumulative risk thresholds would apply.

The SJVAPCD has not established cumulative significance thresholds regarding odor impacts.

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

3.2.4 Impacts Analysis

3.2.4.1 Approach and Methodology

Emissions from construction and operation of the Modified Project were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2.[7] Specifically, emissions were estimated for the campground construction and day use area improvements and minor additions to contractor work area components of the Modified Project. Detailed modeling assumptions are included in Appendix B1. The changes in borrow area location of the Modified Project would result in shorter haul truck trips than what was assessed in the 2019 EIS/EIR for the Approved Project, which would equate to a comparable reduction in emissions. In addition, the additional construction assumptions element of the Modified Project is described for clarification purposes in this SEIR and would result in no change in the emissions or conclusions presented in the 2019 EIS/EIR.

Construction

Construction emissions were calculated for each year of construction and for the estimated worst-case day over the construction period, where the worst-case day is defined as the day with the greatest emissions. Default CalEEMod values were used where detailed Modified Project information was unknown or not available.

For purposes of estimating Modified Project construction emissions, the analysis contained herein is based on the following assumptions (duration of phases is approximate):

- Site preparation – minor additions to contractor work area: June 2021
- Grading – minor additions to contractor work area: June 2021–July 2021
- Site preparation – campground construction and day use area improvements: June 2022–July 2022
- Grading/trenching – campground construction and day use area improvements: July 2022–October 2022
- Building construction – campground construction and day use area improvements: October 2022–August 2023
- Paving – campground construction and day use area improvements: August 2023–November 2023
- Architectural coatings – campground construction and day use area improvements: November 2023–December 2023

While construction could now occur later than identified above, use of the above schedule assumptions provides a conservative basis for the analysis and remains valid for the purposes of estimating construction emissions.

The construction equipment mix and estimated hours of operation per day for the criteria air pollutant emissions modeling are based on default assumptions included in CalEEMod (see Table 3.2-6). For the campground construction and day use area improvements and minor additions to contractor work area components of the Modified Project, it was assumed that heavy construction equipment would be used 5 days per week (22 days per month) during Modified Project construction.

[7] CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant emissions associated with the construction and operational activities from a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters were based on information provided by the Modified Project proponent, or default model assumptions if Modified Project specifics were unavailable.

Table 3.2-6 also presents estimated worker trips, vendor (delivery/water truck) trips, and haul truck trips anticipated for each construction phase. During the grading/trenching phase of campground construction and day use area improvements, approximately 20,000 cubic yards of material would be imported, based on information provided by the Bureau of Reclamation (Reclamation). Assuming a haul truck capacity of 16 cubic yards per truck, it is anticipated that 1,250 round-trip haul truck trips (2,500 one-way trips) would be required to haul this material. Vendor trucks transporting concrete, steel, and other building materials were assumed during building construction. Vendor trucks were also assumed in the grading phases of the Modified Project components to account for water trucks. Also, the CalEEMod default one-way trip lengths were increased for workers (20 miles), vendor trucks (40 miles), and haul trucks (40 miles) to account for transport to and from the nearest cities. Table 3.2-6 presents the construction scenario assumptions used to estimate construction emissions for the Modified Project.

Table 3.2-6. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Daily Usage Hours*
Minor Additions to Contractor Work Area						
Site Preparation	18	0	0	Rubber-Tired Dozers	3	8
				Tractors/Loaders/Backhoes	4	8
Grading	20	4	0	Excavators	2	8
				Graders	1	8
				Rubber-Tired Dozers	1	8
				Scrapers	2	8
				Tractors/Loaders/Backhoes	2	8
Campground Construction and Day Use Area Improvements						
Site Preparation	18	0	0	Rubber-Tired Dozers	3	8
				Tractors/Loaders/Backhoes	4	8
Grading/ Trenching	24	4	2,500	Excavators	2	8
				Graders	1	8
				Rubber-Tired Dozers	1	8
				Scrapers	2	8
				Tractors/Loaders/Backhoes	2	8
				Trencher	1	8
Building Construction	24	20	0	Cranes	1	7
				Forklifts	3	8
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	3	7
				Welders	1	8
Paving	16	0	0	Pavers	2	8
				Paving Equipment	2	8
				Rollers	2	8
Architectural Coatings	10	0	0	Air Compressors	1	6

Notes: See Appendix B1 for details.

Operations

Emissions from the operational phase of the Modified Project were estimated using CalEEMod. Specifically, emissions were estimated for campground construction and day use area improvements only, because that is the only component of the Modified Project that would result in long-term operational emissions. Year 2024 was assumed as the first full year of proposed campground/improved San Luis Creek Day Use Area operations. For the maximum daily emissions, it was assumed that all campsites would be filled. For annual emissions, it was assumed that the proposed campground would have an average occupancy rate of 40%, based on input from the California Department of Parks and Recreation (Heberling, pers. comm. 2020). Default CalEEMod values were used where detailed Modified Project information was unknown or not available. Detailed modeling assumptions are included in Appendix B1 and a summary of assumptions by source is provided below.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, which include emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Consumer products are chemically formulated products used by household and institutional consumers, including items such as cleaning compounds, cosmetics, personal care products, disinfectants, and sanitizers (CAPCOA 2017). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of buildings and on the default factor of pounds of VOC per building square foot per day. For the proposed paved areas, CalEEMod estimates VOC emissions associated with use of surface degreasers based on a square footage of paved surface area and pounds of VOC per square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of nonresidential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the nonresidential surface area for painting equals 2.0 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. For asphalt surfaces, the architectural coating area is assumed to be 6% of the total square footage, consistent with the supporting CalEEMod studies provided as an appendix to the CalEEMod User's Guide (CAPCOA 2017).

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors.

Energy Sources

Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for greenhouse gas emissions in CalEEMod, because criteria pollutant emissions would occur at the site of power plants, which are not on the Modified Project site. A separate workbook was developed to estimate emissions associated with combustion of propane, which would be used to heat water for the campground restroom facilities. According to California Department of Parks and Recreation, it is anticipated that the proposed campground would require approximately 1,300 gallons of propane on an annual basis. Emission factors for propane combustion were from the EPA's AP-42 Section 1.5 (Liquefied Petroleum Gas Combustion) (EPA 2008a) and from A National Methodology and Emission Inventory for Residential Fuel Combustion (Haneke n.d.). No other sources of natural gas consumption are anticipated for operation.

Mobile Sources

Mobile sources for the Modified Project would primarily be motor vehicles traveling to and from the Modified Project site. Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. The default vehicle mix provided in CalEEMod was applied to the Modified Project. Emission factors representing year 2024 were used to estimate emissions associated with the first full year of new campground operations. As described in Section 3.7, Traffic and Transportation, of this SEIR, camping at Basalt Campground primarily attracts visitors interested in boating activities at either O'Neill Forebay or San Luis Reservoir. The proposed campground is expected to attract visitors interested in participating in these same recreational activities. The nearest alternative to similar camping activities would be provided by the Los Banos Creek Campground, approximately 16 miles to the southeast. Otherwise, additional alternative recreational camping and boating activities would be provided by several reservoirs and lakes within the foothills of the Sierra Nevada, including Hensley Lake, Millerton Lake, Eastman Lake, Lake McClure, and Don Pedro Reservoir. All are located 70 miles or more from the Modified Project. As such, an additional campground within San Luis Reservoir State Recreation Area would likely reduce trips made from communities in the nearby coastal regions to recreational camping and boating activities further to the east, thereby decreasing the net vehicle miles traveled in the region. However, this potential vehicle miles traveled reduction was not accounted for in CalEEMod; rather, default trip lengths for the surrogate mobile home land use were assumed for camping uses to provide a conservative estimate of vehicle miles traveled.

Campfire Emissions

For campfire emissions, the Piled Fuels Biomass and Emissions Calculator (FERA et al. 2014) was used, assuming a campsite would burn a bundle of approximately 0.75 cubic feet of hardwood per night. For the maximum daily emissions, it was assumed that all campsites would be filled and would have a campfire, whereas for annual emissions, it was assumed that 40% of the campsites would have a campfire, based on the anticipated annual average occupancy rate of 40% provided by the California Department of Parks and Recreation.

Ambient Air Quality Impacts

This analysis includes an ambient air quality assessment to evaluate potential ambient air quality impacts associated with the Modified Project and determine if emissions are predicted to cause or contribute to a violation of an ambient air quality standard by exceeding any NAAQS or CAAQS. Dispersion modeling results are provided in Appendix B2.

Construction

The dispersion modeling was performed using the American Meteorological Society/EPA Regulatory Model (AERMOD), which is the model SJVAPCD requires for atmospheric dispersion of emissions. Off-site concentrations were modeled for the construction phase for the estimated Modified Project emissions in order to determine compliance with the CAAQS and NAAQS. Principal parameters of AERMOD for the Modified Project construction include the following:

- **Dispersion Modeling.** AERMOD was run with all sources emitting unit emissions (1 gram per second) to obtain the "X/Q" values. X/Q is a dispersion factor that is the average effluent concentration normalized by source strength and is used as a way to simplify the representation of emissions from many sources. The X/Q values of ground-level concentrations were determined for construction emissions using AERMOD and the maximum concentrations determined for the 1-hour, 3-hour, 8-hour, 24-hour, and Period averaging periods recommended by the SJVAPCD.

- **Meteorological Data.** The latest 5-year meteorological data (2004–2008) for the Los Banos station (Station ID 66666) from SJVAPCD were used.
- **Urban and Rural Options.** Urban areas typically have more surface roughness as well as structures and low-albedo surfaces that absorb more sunlight—and thus more heat—relative to rural areas. However, in accordance with the SJVAPCD guidelines, the rural dispersion option was selected due to the undeveloped nature of the Modified Project area.
- **Modeling Options.** The modeling included the use of standard regulatory default options.
- **Terrain Characteristics.** Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate. The National Elevation Dataset with resolution of 1/3 arc-second was used.
- **Modeling Grid.** A nested grid of sensitive receptors was evaluated to capture maximum ambient pollutant impacts. This telescoping grid of receptors was set up with the following resolutions:
  - 25-meter spacing on the facility boundary
  - 25-meter spacing from facility boundary to 100 meters
  - 50-meter spacing from 100 meters to 250 meters
  - 100-meter spacing from 250 meters to 500 meters
  - 250-meter spacing from 500 meters to 1 kilometer
  - 500-meter spacing from 1 kilometer to 2 kilometers
- **Source Release Characterizations.** For modeling construction emissions impacts using AERMOD, based on the types and number of concurrent activities for the Modified Project, it was assumed that the most intense activity would be located at the dam during development of the stability berm and expanded embankment. The construction area was modeled as a single area source with an initial vertical dimension of 1.4 meters and release height of 5 meters.

Operations

Because operational activities would be minimal, ambient air quality modeling was not performed for operational activities associated with the Modified Project.

3.2.4.2 Impact Discussion

Threshold 1

Would the Modified Project conflict with or obstruct implementation of the applicable air quality plan?

2019 EIS/EIR Impact Determination	Modified Project Impact Determination	New Significant Increase in Impact Severity?
Less than Significant with Mitigation Incorporated	Less than Significant with Mitigation Incorporated	No

The SJVAPCD has prepared plans to attain federal and state O_3 and particulate matter ambient air quality standards as required under the federal and California Clean Air Acts, as detailed in Section 3.2.2. The SJVAPCD has established thresholds of significance for criteria pollutant emissions (see Table 3.2-4) and projects with emissions below the annual thresholds of significance for criteria pollutants would be determined to "not conflict or obstruct implementation of the District's air quality plan" (SJVAPCD 2015a). As analyzed in the 2019 EIS/EIR, the Approved Project would exceed the SJVAPCD annual thresholds of significance without mitigation. With mitigation, the Approved Project would result in emissions below the SJVAPCD thresholds.

Campground Construction and Day Use Area Improvements and Minor Additions to Contractor Work Area

As discussed under Threshold 2, emissions of criteria air pollutants associated with the minor additions to the contractor work area (construction only) and proposed campground area and San Luis Creek Day Use Area improvement (construction and operations) elements of the Modified Project would not exceed the SJVAPCD thresholds of significance. However, when summed with the Approved Project emissions, the combined emissions of the Modified Project would exceed the SJVAPCD thresholds without mitigation; therefore, a significant impact would occur. In order to mitigate for this impact, mitigation is provided. **Mitigation Measure AQ-1 (same as AQ-1 in the 2019 EIS/EIR)** requires lower emitting construction equipment, **Mitigation Measure AQ-2 (same as AQ-2 in the 2019 EIS/EIR)** requires newer on-road trucks, and **Mitigation Measure AQ-3 (same as AQ-3 in the 2019 EIS/EIR)** requires implementation of a fugitive dust control plan with associated measures, such as stabilizing disturbed areas of dust and limiting trackout. After mitigation, construction and operational emissions of the Modified Project would not exceed the SJVAPCD thresholds and would not conflict with or obstruct implementation of the SJVAPCD's air quality plans. This impact would be **less than significant after mitigation.**

Changes in Borrow Area Location

Borrow Areas 12 and 14 are closer to the dam construction site than Borrow Area 6 and existing roads allow for access from these borrow areas to the dam. Hauling materials from these borrow areas would be preferable for construction because it would reduce the length of haul trips, which would also reduce associated air pollutant emissions. Thus, emissions associated with this Modified Project element are conservatively assumed to be accounted for in the 2019 EIS/EIR. This element of the Modified Project would not conflict with or obstruct implementation of the SJVAPCD's air quality plans and the impact would be **less than significant.**

Additional Construction Assumptions

As discussed in Chapter 2, Project Description, of this SEIR, the overall construction schedule and assumptions regarding personnel and equipment remain unchanged by the Modified Project. Although dewatering was only briefly mentioned in the 2019 EIS/EIR, this activity would be required for the Approved Project and is not a discreet addition for the Modified Project. Overall, the additional construction assumptions are described for clarification purposes in the SEIR. Based on the above considerations, these elements of the Modified Project would not conflict with or obstruct implementation of the SJVAPCD's air quality plans. This impact would be **less than significant.**

Summary

In summary, construction and operational emissions of the Modified Project elements would not exceed the SJVAPCD thresholds of significance when summed with the emission of the Approved Project after implementation of mitigation to reduce construction emissions. As such, the Modified Project overall would not conflict with or obstruct implementation of the applicable air quality plans. This impact would be **less than significant after mitigation.**

Comparison to 2019 EIS/EIR

The additional project components analyzed above would result in less-than-significant impacts with mitigation incorporated and therefore impacts of the Modified Project would not result in a significant increase in the severity of impacts as determined in the 2019 EIS/EIR. Impacts of the Modified Project would remain less than significant with mitigation incorporated (see Section 3.2.5).

Threshold 2

Would the Modified Project violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard?

2019 EIS/EIR Impact Determination	Modified Project Impact Determination	New Significant Increase in Impact Severity?
Less than Significant with Mitigation Incorporated	Less than Significant with Mitigation Incorporated	No

Campground Construction and Day Use Area Improvements and Minor Additions to Contractor Work Area

Construction

Proposed construction activities associated with the various Modified Project elements would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and ROG off-gassing from asphalt pavement and architectural coating) and off-site sources (i.e., on-road haul trucks, delivery trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Therefore, such emission levels can only be estimated, with a corresponding uncertainty in precise ambient air quality impacts. Emissions associated with the construction and operation of the Modified Project elements were quantified where appropriate and were summed with the Approved Project emissions in order to determine the potential impact of the Modified Project overall.

Construction associated with the minor additions to the contractor work area was conservatively assumed to occur over a 2-month period, beginning in June 2021. Construction of the proposed campground and San Luis Creek Day Use Area improvements are anticipated to occur over an 18-month period, beginning in June 2022. Construction scenario assumptions for these elements of the Modified Project, including phasing, equipment mix, and vehicle trips, were based on information provided by Reclamation and CalEEMod generated default values where Modified Project specifics were not available. Complete detailed construction assumptions are included in Appendix B1 for these elements of the Modified Project.

Table 3.2-7 presents the estimated unmitigated annual emissions generated during construction of the Modified Project.

Table 3.2-7. Unmitigated Annual Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per year					
Minor Additions to Contractor Work Area[1]						
2021	0.09	0.92	0.61	<0.01	0.27	0.14

Table 3.2-7. Unmitigated Annual Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per year					
Campground Construction and Day Use Area Improvements[2]						
2022	0.25	2.64	1.98	0.01	0.72	0.38
2023	0.65	1.86	2.09	0.01	0.21	0.11
Approved Project Construction[3]						
Annual Average	8.35	86.76	67.16	0.20	12.97	6.22
Modified Project - Annual Emissions	**9.00**	**89.40**	**69.25**	**0.21**	**13.69**	**6.60**
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	**No**	**Yes**	**No**	**No**	**No**	**No**

Source: Appendix B1.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SJVAPCD = San Joaquin Valley Air Pollution Control District.

1 While construction could now occur later than identified by dates provided, use of the schedule assumptions provides a conservative basis for the analysis and remains valid for the purposes of estimating construction emissions.

2 These elements of the Modified Project were modeled using CalEEMod based on the assumptions outlined in the Construction subsection of Section 3.2.4.1, Approach and Methodology.

3 In the 2019 EIS/EIR, all haul truck trips were assumed to be 40-miles one-way, which overestimated the associated emissions. This was adjusted herein for haul trucks in order to account for the shorter trip length between the borrow areas and worksites. 15% of total trips were still conservatively assumed to require 40-mile one-way trips, with the remainder of trips occurring on site with a one-way trip length of 4 miles.

As shown in Table 3.2-7, emissions from construction of the minor additions to the contractor work area and proposed campground and San Luis Creek Day Use Area improvement elements of the Modified Project would be minimal and would not exceed the SJVAPCD thresholds. However, when summed with the Approved Project emissions, the unmitigated scenario of the overall Modified Project would exceed the SJVAPCD NO_x threshold during construction; therefore, a significant impact would occur. Construction of the Modified Project would not exceed the SJVAPCD annual thresholds for ROG, CO, SO_x, PM_{10}, or $PM_{2.5}$. Because the Modified Project would exceed the SJVAPCD thresholds during construction, it would result in a potentially significant impact related to the potential to violate any air quality standard or contribute substantially to an existing or projected air quality violation. In order to mitigate for this impact, mitigation is provided. **Mitigation Measure AQ-1** requires lower emitting construction equipment, **Mitigation Measure AQ-2** requires newer on-road trucks, and **Mitigation Measure AQ-3** requires implementation of a fugitive dust control plan with associated measures, such as stabilizing disturbed areas of dust and limiting trackout. Table 3.2-8 presents the estimated mitigated annual emissions generated during construction of the Modified Project.

Table 3.2-8. Mitigated Annual Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per year					
Minor Additions to Contractor Work Area[1]						
2021	0.02	0.08	0.64	<0.01	0.11	0.05
Campground Construction and Day Use Area Improvements[2]						
2022	0.08	0.60	2.16	0.01	0.33	0.15
2023	0.54	0.61	2.28	0.01	0.15	0.05

Table 3.2-8. Mitigated Annual Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per year					
Approved Project Construction[3]						
Annual Average	2.72	8.66	42.82	0.20	5.87	1.82
Modified Project - Maximum Annual Emissions	**3.26**	**9.27**	**45.10**	**0.21**	**6.20**	**1.97**
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Appendix B1.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SJVAPCD = San Joaquin Valley Air Pollution Control District.
Emissions account for implementation of Mitigation Measures AQ-1, AQ-2, and AQ-3 described in Section 3.2.5, Mitigation Measures.

1 While construction could now occur later than identified, use of the schedule assumptions provides a conservative basis for the analysis and remains valid for the purposes of estimating construction emissions.
2 These elements of the Modified Project were modeled using CalEEMod based on the assumptions outlined in the Construction subsection of Section 3.2.4.1, Approach and Methodology.
3 In the 2019 EIS/EIR, all haul truck trips were assumed to be 40-miles one-way, which overestimated the associated emissions. This was adjusted herein for haul trucks in order to account for the shorter trip length between the borrow areas and worksites. 15% of total trips were still conservatively assumed to require 40-mile one-way trips, with the remainder of trips occurring on site with a one-way trip length of 4 miles.

As depicted in Table 3.2-8, after mitigation, construction emissions generated by the Modified Project would not exceed the SJVAPCD thresholds and would not violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard. This impact would be **less than significant after mitigation.**

In addition to the annual criteria air pollutant emissions analysis, an ambient air quality impacts assessment for the off-site atmosphere to which the general public has reasonable access should be performed if any on-site pollutants exceed 100 pounds per day, as recommended by the Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015a). Table 3.2-9 shows the maximum daily unmitigated construction emissions for the Modified Project, which includes on-site and off-site emissions.

Table 3.2-9. Unmitigated Maximum Daily Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NOx	CO	SOx	PM10	PM2.5
	Pounds per day					
Minor Additions to Contractor Work Area[2]						
2021	4.51	47.86	33.50	0.07	20.66	11.96
Campground Construction and Day Use Area Improvements[1]						
2022	4.46	48.74	34.99	0.09	20.23	11.56
2023	43.21	18.40	19.63	0.06	2.18	1.08
Approved Project Construction[3]						
Daily Average	54.61	570.44	485.35	1.12	75.12	38.06

Table 3.2-9. Unmitigated Maximum Daily Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NOx	CO	SOx	PM10	PM2.5
	Pounds per day					
Modified Project - Maximum Daily Emissions	**97.82**	**619.18**	**520.34**	**1.21**	**95.78**	**50.02**

Source: Appendix B1.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SJVAPCD = San Joaquin Valley Air Pollution Control District.
Although maximum daily emissions represent only on-site sources, off-site vehicular emissions were also included in the summation as a conservative estimate.

1 While construction could now occur later than identified, use of the schedule assumptions provides a conservative basis for the analysis and remains valid for the purposes of estimating construction emissions.
2 These elements of the Modified Project were modeled using CalEEMod based on the assumptions outlined in the Construction subsection of Section 3.2.4.1, Approach and Methodology. Maximum daily emissions are from the summer or winter outputs, whichever was greater.
3 In the 2019 EIS/EIR, all haul truck trips were assumed to be 40-miles one-way, which overestimated the associated emissions. This was adjusted herein for haul trucks in order to account for the shorter trip length between the borrow areas and worksites. 15% of total trips were still conservatively assumed to require 40-mile one-way trips, with the remainder of trips occurring on site with a one-way trip length of 4 miles.

As shown in Table 3.2-9, the minor additions to the contractor work area and proposed campground area and San Luis Creek Day Use Area improvement elements of the Modified Project would be minimal and would not exceed 100 pounds per day during construction. However, when summed with the Approved Project emissions, the unmitigated scenario of the overall Modified Project would exceed 100 pounds per day of NO_x and CO during construction; therefore, a potentially significant impact would occur. Construction of the Modified Project would not exceed the 100 pounds per day for ROG, SO_x, PM_{10}, or $PM_{2.5}$. In order to mitigate for this potential impact, mitigation is provided. Mitigation Measure AQ-1 requires lower emitting construction equipment, Mitigation Measure AQ-2 requires newer on-road trucks, and Mitigation Measure AQ-3 requires implementation of a fugitive dust control plan with associated measures, such as stabilizing disturbed areas of dust and limiting trackout. Table 3.2-10 presents the estimated maximum daily mitigated emissions generated during construction of the Modified Project.

Table 3.2-10. Mitigated Maximum Daily Construction Criteria Air Pollutant Emissions

Year[1]	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per day					
Minor Additions to Contractor Work Area[2]						
2021	1.08	4.76	35.62	0.07	8.74	4.68
Campground Construction and Day Use Area Improvements[2]						
2022	1.28	9.99	38.89	0.09	8.74	4.68
2023	43.04	6.66	21.03	0.06	1.58	0.51
Approved Project Construction[3]						
Daily Average	18.19	57.68	325.71	1.12	33.50	10.82
Modified Project - Maximum Daily Emissions	**61.23**	**67.67**	**364.60**	**1.21**	**42.24**	**15.50**

Source: Appendix B1.

Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SJVAPCD = San Joaquin Valley Air Pollution Control District.
Although maximum daily emissions represent only on-site sources, off-site vehicular emissions were also included in the summation as a conservative estimate. Emissions account for implementation of Mitigation Measures AQ-1, AQ-2, and AQ-3 described in Section 3.2.5, Mitigation Measures.

1 While construction could now occur later than identified, use of the schedule assumptions provides a conservative basis for the analysis and remains valid for the purposes of estimating construction emissions.

2 These elements of the Modified Project were modeled using CalEEMod based on the assumptions outlined in the Construction subsection of Section 3.2.4.1, Approach and Methodology. Maximum daily emissions are from the summer or winter outputs, whichever was greater.

3 In the 2019 EIS/EIR, all haul truck trips were assumed to be 40-miles one-way, which overestimated the associated emissions. This was adjusted herein for haul trucks in order to account for the shorter trip length between the borrow areas and worksites. 15% of total trips were still conservatively assumed to require 40-mile one-way trips, with the remainder of trips occurring on site with a one-way trip length of 4 miles.

As shown in Table 3.2-10, with mitigation, all of the criteria air pollutants except for CO would be below 100 pounds per day during construction of the Modified Project. The SJVAPCD recommends that an ambient air quality assessment be performed when emissions of any criteria pollutant would equal or exceed any applicable threshold of significance for criteria pollutants or 100 pounds per day of any criteria pollutant (SJVAPCD 2015a). As such, an ambient air quality assessment was performed to determine whether construction of the Modified Project would exceed the NAAQS or CAAQS.

Maximum mitigated daily emissions were used as the basis for determining the Modified Project's potential impact on ambient air quality. For the initial assessment (Step 1) of the ambient air quality assessment, the maximum background concentration for the modeled Modified Project site for each pollutant and averaging period combination was added to the corresponding maximum ground-level concentration from Modified Project-related construction. The sum of these values was then compared to the corresponding ambient air quality standard. If the incremental increase in concentration from Modified Project-related sources did not cause an exceedance of an ambient air quality standard, then the analysis was complete for that source/receptor/pollutant combination. If the incremental increase in concentration from Modified Project-related sources caused an exceedance of an ambient air quality standard, then the analysis proceeded to Step 2. Step 2 was similar to Step 1 with one major difference—for Step 2, the maximum ground-level concentration of each pollutant and averaging period combination were compared to the pollutant's corresponding significant impact level. The significant impact level is used to evaluate whether the Modified Project's construction emissions would contribute to a violation of an ambient air quality standard, where the background level is close to or exceeds an ambient air quality standard. If the maximum ground-level concentration did not exceed the corresponding significant impact level, then the analysis was complete for that source/receptor/pollutant combination, and no further analysis was required. Table 3.2-11 presents a summary of the two-step process taken to determine whether construction activities associated with the Modified Project would cause or contribute to ambient air quality impacts, with the detailed ambient air quality assessment included in Appendix B2.

Table 3.2-11. Mitigated Construction Ambient Air Quality Impact Assessment Results

Step 1 – Ambient Air Quality Standard Basis				
		AAQS	*Maximum Concentration: Modified Project + Background Levels*	
Impact Parameter	*Applicable Standard*	*μg/m³*	*μg/m³*	*Exceed AAQS?*
1-hour CO	State	22,900	2,280	No
	Federal	40,100	2,280	No
8-hour CO	State	10,300	1,593	No
	Federal	10,300	1,593	No
1-hour NO_2	State	339	141	No
	Federal	188	141	No
Annual NO_2	State	57	16	No
	Federal	100	18	No
1-hour SO_2	State	655	24	No
	Federal	196	24	No
24-Hour SO_2	State	105	6	No
	Federal	367	6	No
Annual SO_2	Federal	79	1	No
24-hour PM_{10}	State	50	101	*Yes (Step 2)*
	Federal	150	99	No
Annual PM_{10}	State	20	31	*Yes (Step 2)*
24-hour $PM_{2.5}$	Federal	35	42	*Yes (Step 2)*
Annual $PM_{2.5}$	State	12	11	No
	Federal	12	11	No
Step 2 – SIL Basis				
		Class II SILs	*Modified Project Contribution*	
Impact Parameter		*μg/m³*	*μg/m³*	*Exceed SIL?*
24-hour PM_{10}		5	2.69	No
Annual PM_{10}		1	0.38	No
24-hour $PM_{2.5}$		5	1.35	No

Source: Appendix B2.

Notes: AAQS = ambient air quality standard μg/m³ = micrograms per cubic meter; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SIL = significant impact level.

As demonstrated in Table 3.2-11, the Modified Project would result in construction activities that would generate ambient concentrations of all criteria air pollutants that would be below the applicable thresholds. This impact would be **less than significant after mitigation.**

Operations

Emissions from the operational phase of the Modified Project were estimated for the campground construction and day use area improvements only, because that is the only component of the Modified Project that would result in long-term operational emissions. Operation of the proposed campground/improved San Luis Creek Day Use Area would generate criteria pollutant emissions from area sources (consumer products, architectural coatings, and landscaping equipment), propane combustion, mobile sources (vehicular traffic), and wood burning in campfires. Table 3.2-12 presents the estimated unmitigated annual emissions generated during operation of the Modified Project.

Table 3.2-12. Unmitigated Annual Operational Criteria Air Pollutant Emissions

Source	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per year					
Campground Construction and Day Use Area Improvements						
Area	0.17	0.01	0.59	<0.01	<0.01	<0.01
Propane	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Mobile	0.05	0.54	0.54	<0.01	0.19	0.05
Campfires	<0.01	0.00	0.07	0.00	0.01	0.01
Total Operational Emissions	**0.22**	**0.56**	**1.21**	**0.00**	**0.20**	**0.06**
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold Exceeded?	No	No	No	No	No	No

Source: Appendix B1.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SJVAPCD = San Joaquin Valley Air Pollution Control District.

As shown in Table 3.2-12, the proposed campground and San Luis Creek Day Use Area improvement elements of the Modified Project would result in minimal annual criteria air pollutant emissions and would not exceed the SJVAPCD thresholds during operations. Therefore, operation of the Modified Project would not violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard. This impact would be **less than significant.**

In addition to the annual criteria air pollutant emissions analysis, an ambient air quality impacts assessment for the off-site atmosphere to which the general public has reasonable access should be performed if any on-site pollutants exceed 100 pounds per day, as recommended by the Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015a). Table 3.2-13 shows the maximum daily unmitigated operational emissions for the Modified Project.

Table 3.2-13. Unmitigated Maximum Daily Operational Criteria Air Pollutant Emissions

Source	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per day					
Campground Construction and Day Use Area Improvements						
Area	1.01	0.08	6.52	<0.01	0.04	0.04
Propane	<0.01	0.05	0.03	<0.01	<0.01	<0.01
Mobile	0.75	7.31	8.11	0.05	2.66	0.73
Campfires	0.00	0.00	<0.01	0.00	<0.01	<0.01
Total Operational Emissions	**1.76**	**7.44**	**14.66**	**0.05**	**2.70**	**0.77**

Source: Appendix B1.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SJVAPCD = San Joaquin Valley Air Pollution Control District.
Although maximum daily emissions represent only on-site sources, off-site vehicular emissions were also included in the summation as a conservative estimate.

As shown in Table 3.2-13, the proposed campground and San Luis Creek Day Use Area improvement elements of the Modified Project would result in minimal daily criteria air pollutant emissions and would not exceed 100 pounds per day. Therefore, operation of the Modified Project would not violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard. This impact would be **less than significant.**

Changes in Borrow Area Location

As mentioned in Section 3.2.4.1, Approach and Methodology, emissions were estimated only for the campground construction and day use area improvements and minor additions to contractor work area elements of the Modified Project. Changes to the borrow area location would result in shorter haul truck trips than what was assessed in the 2019 EIS/EIR, which would equate to a comparable reduction in emissions. This element of the Modified Project would not violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard and the impact would be **less than significant.**

Additional Construction Assumptions

As discussed in Chapter 2 of this SEIR, the overall construction schedule and assumptions regarding personnel and equipment remain unchanged by the Modified Project. Although dewatering was only briefly mentioned in the 2019 EIS/EIR, this activity would be required for the Approved Project and is not a discreet addition for the Modified Project. Overall, the additional construction assumptions are described for clarification purposes in the SEIR. Based on the above considerations, these elements of the Modified Project would not violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard. This impact would be **less than significant.**

Summary

In summary, construction and operational emissions of the Modified Project elements would not exceed the SJVAPCD thresholds of significance when summed with the Approved Project emissions, after implementation of mitigation to reduce construction emissions. As such, the Modified Project overall would not violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard. This impact would be **less than significant after mitigation.**

Comparison to 2019 EIS/EIR

The additional project components analyzed above would result in less-than-significant impacts with mitigation incorporated and therefore impacts of the Modified Project would not result in a significant increase in the severity of impacts as determined in the 2019 EIS/EIR. Impacts of the Modified Project would remain less than significant with mitigation incorporated (see Section 3.2.5).

Threshold 3

Would the Modified Project result in a cumulatively considerable net increase of any criteria pollutant for which the area of analysis is nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone [O_3] precursors)?

2019 EIS/EIR Impact Determination	Modified Project Impact Determination	New Significant Increase in Impact Severity?
Significant and Unavoidable	Significant and Unavoidable	No

Air pollution by nature is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and the SJVAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, and as discussed in the Cumulative Impacts subsection of Section 3.2.3, Thresholds of Significance, the potential for the Modified Project to result in a cumulatively considerable impact, per the SJVAPCD guidance and thresholds, is based on the Modified Project's potential to exceed the project-specific annual thresholds. However, a project's emissions may be individually limited but cumulatively considerable when taken in combination with past, present, and future development within the SJVAB (SJVAPCD 2015a).

As discussed under Threshold 2, construction and operation of the Modified Project elements would result in a minimal increase in criteria air pollutant emissions and would not exceed the applicable SJVAPCD annual thresholds when summed with the Approved Project emissions, after implementation of Mitigation Measures AQ-1, AQ-2, and AQ-3 to reduce construction emissions, which require lower emitting construction equipment (AQ-1), newer on-road trucks (AQ-2), and implementation of a fugitive dust control plan with associated measures, such as stabilizing disturbed areas of dust and limiting trackout (AQ-3). However, other cumulative projects in the SJVAB would also result in emissions concurrently with the Modified Project, as listed in Chapter 3, Environmental Analysis, Table 3-1. Of particular note, because the B.F. Sisk Dam Raise and Reservoir Expansion Project (reservoir expansion project) would be constructed as a further modification to B.F. Sisk Dam and within an overlapping time period as the Modified Project, and because construction of the reservoir expansion project would result in emissions of NO_x and PM_{10} that exceed the SJVAPCD thresholds of significance after mitigation, as concluded by the joint EIR and Supplemental EIS prepared by Reclamation and the San Luis & Delta–Mendota Water Authority for the reservoir expansion project (SLDMWA and Reclamation 2020), the construction and operational emissions generated by the Modified Project would contribute to a cumulatively significant impact. As such, this impact would be **significant and unavoidable.**

Comparison to 2019 EIS/EIR

The additional project components analyzed above would result in significant and unavoidable impacts even with mitigation incorporated and therefore impacts of the Modified Project would not result in a significant increase in the severity of impacts as determined in the 2019 EIS/EIR. Impacts of the Modified Project would remain significant and unavoidable.

Threshold 4

Would the Modified Project expose sensitive receptors to substantial pollutant concentrations?

2019 EIS/EIR Impact Determination	Modified Project Impact Determination	New Significant Increase in Impact Severity?
Less than Significant with Mitigation Incorporated	Less than Significant with Mitigation Incorporated	No

As described in the Sensitive Receptors subsection of Section 3.2.1, the SJVAPCD considers hospitals, schools, parks, playgrounds, daycare centers, nursing homes, convalescent facilities, and residential areas as sensitive receptor land uses (SJVAPCD 2015a). For the Approved Project, the nearest residential receptor would be approximately 8,250 feet from the Modified Project site. For the additional project elements included in the Modified

Project, the nearest point of construction activities to the closest sensitive receptors (i.e., residential subdivision to the east) for the proposed changes in borrow areas would be approximately 11,630 feet from Borrow Area 12 and approximately 10,700 feet from Borrow Area 14; the nearest point of construction activities to the closest sensitive receptors (i.e., residences east of O'Neill Forebay) for the proposed campground construction would be approximately 10,900 feet; the nearest point of construction activities to the closest sensitive receptors (i.e., residence at Harper Lane south of Basalt Hill Borrow Area) for the proposed minor additions to contractor work areas would be approximately 14,300 feet.

Toxic Air Contaminants

Construction of the Modified Project would require use of heavy-duty construction equipment and diesel trucks, which are subject to CARB Airborne Toxic Control Measures for in-use diesel construction equipment and diesel trucks to reduce diesel particulate emissions. According to the SJVAPCD, health risk assessments (which determine the exposure of sensitive receptors to toxic emissions) should be based on a 70-year exposure period for the maximally exposed individual resident. However, such assessments should also be limited to the period/duration of activities associated with the project. The construction period for the Modified Project is expected to be approximately 8 to 10 years with a maximum duration of 20 years if funding constraints are encountered, after which construction-related TAC emissions would cease. Also, as indicated in the 2019 EIS/EIR, DPM exposure was determined to be less than significant based on the substantial distance to sensitive receptors. For context, as noted in CARB's Air Quality and Land Use Handbook (CARB 2005), DPM concentrations are expected to drop off 80% at approximately 1,000 feet from a distribution center and 70% at 500 feet from a major freeway. Therefore, the exposure of sensitive receptors to DPM from the Modified Project is expected to be minimal because of the distance from the construction activities at the Modified Project site. In addition to the reduction in DPM concentrations due to distance from construction areas to sensitive receptors, the Modified Project would also implement Mitigation Measure AQ-1, which requires Tier 4 equipment that would also substantially reduce DPM emissions by requiring cleaner engines in off-road equipment.

In regard to long-term operations, the only elements of the Modified Project that would result in long-term emissions would be the proposed campground/improved San Luis Creek Day Use Area. However, based on the recreational activities at this land use, there are no meaningful sources of TACs for the operating phase of the Modified Project, and therefore, no reason to expect health impacts related to TACs. Overall, the Modified Project would not expose sensitive receptors to substantial TACs and this impact would be **less than significant.**

Valley Fever Exposure

As discussed above for TACs, existing sensitive receptors would be an extensive distance from construction activities associated with the Modified Project that would generate substantial fugitive dust. Thus, potential exposure of sensitive receptors to spores of the *Coccidioides immitis* fungus would be minimal. In addition, as previously discussed in Section 3.2.2 and detailed in Mitigation Measure AQ-3, the Modified Project would comply with SJVAPCD Regulation VIII, which requires construction contractors to minimize fugitive dust through measures such as stabilizing disturbed areas, including storage piles, with water or chemical stabilizer/suppressant, as well as preventing trackout from on-road vehicles. Implementation of these best management practices would ensure fugitive dust impacts would be less than significant for all construction phases of the Modified Project and also control the release of the *Coccidioides immitis* fungus from construction activities. In addition, the Modified Project shall meet the requirements of Labor Code Section 6709 as follows:

(a) The Legislature finds and declares that Valley Fever is caused by a microscopic fungus known as *Coccidioides immitis*, which lives in the top 2 to 12 inches of soil in many parts of the state. When soil is disturbed by activities such as digging, grading, driving, or is disturbed by environmental conditions such as or high winds, fungal spores can become airborne and can potentially be inhaled.

(b) This section applies to a construction employer with employees working at worksites in counties where Valley Fever is highly endemic, including, but not limited to, the Counties of Fresno, Kern, Kings, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Santa Barbara, Tulare, and Ventura, where work activities disturb the soil, including, but not limited to, digging, grading, or other earth moving operations, or vehicle operation on dirt roads, or high winds. Highly endemic means that the annual incidence rate of Valley Fever is greater than 20 cases per 100,000 persons per year.

(c) An employer subject to this section pursuant to subdivision (b) shall provide effective awareness training on Valley Fever to all employees by May 1, 2020, and annually by that date thereafter, and before an employee begins work that is reasonably anticipated to cause exposure to substantial dust disturbance. Substantial dust disturbance means visible airborne dust for a total duration of one hour or more on any day. The training may be included in the employer's injury and illness prevention program training or as a standalone training program. The training shall include all of the following topics:

  (1) What Valley Fever is and how it is contracted.

  (2) High risk areas and types of work and environmental conditions during which the risk of contracting Valley Fever is highest.

  (3) Personal risk factors that may create a higher risk for some individuals, including pregnancy, diabetes, having a compromised immune system due to causes including, but not limited to, human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS), having received an organ transplant, or taking immunosuppressant drugs such as corticosteroids or tumor necrosis factor inhibitors.

  (4) Personal and environmental exposure prevention methods that may include, but are not limited to, water-based dust suppression, good hygiene when skin and clothing is soiled by dust, limiting contamination of drinks and food, working upwind from dusty areas when feasible, wet cleaning dusty equipment when feasible, and wearing a respirator when exposure to dust cannot be avoided.

  (5) The importance of early detection, diagnosis, and treatment to help prevent the disease from progressing. Early diagnosis and treatment are important because the effectiveness of medication is greatest in early stages of the disease.

  (6) Recognizing common signs and symptoms of Valley Fever, which include fatigue, cough, fever, shortness of breath, headache, muscle aches or joint pain, rash on upper body or legs, and symptoms similar to influenza that linger longer than usual.

  (7) The importance of reporting symptoms to the employer and seeking medical attention from a physician and surgeon for appropriate diagnosis and treatment.

  (8) Common treatment and prognosis for Valley Fever.

(d) Training materials may include existing material on Valley Fever developed by a federal, state, or local agency, including, but not limited to, the federal Centers for Disease Control and Prevention, the State Department of Public Health, or a local health department.

(e) In the event that a county which has not been previously identified as being highly endemic is determined to be highly endemic per the annual report published by the State Department of Public Health, this section shall not apply in the initial year of that county's listing in the report. However, this section shall begin to apply to employers in that county in the year subsequent to the department's publication that initially identified the county as being highly endemic.

(f) This section shall apply to an employer whenever employment exists in connection with the construction, alteration, painting, repairing, construction maintenance, renovation, removal, or wrecking of any fixed structure or its parts.

Overall, based on the preceding considerations, the Modified Project would not expose sensitive receptors to substantial Valley Fever exposure. This impact would be **less than significant**.

Health Effects of Criteria Air Pollutants

Construction and operation of the Modified Project would not result in emissions that exceed the SJVAPCD emission thresholds for any criteria air pollutant after implementation of mitigation to reduce construction emissions, which requires lower emitting construction equipment (**Mitigation Measure AQ-1**), newer on-road trucks (**Mitigation Measure AQ-2**), and implementation of a fugitive dust control plan with associated measures, such as stabilizing disturbed areas of dust and limiting trackout (**Mitigation Measure AQ-3**).

ROG and NO_x are precursors to O_3, for which the SJVAB is designated as nonattainment with respect to the NAAQS and CAAQS. Nonetheless, because ROG and NO_x emissions associated with Modified Project construction would not exceed the SJVAPCD thresholds after mitigation, it is not anticipated the Modified Project would contribute substantially to regional O_3 concentrations and the associated health effects. In addition, the operational emissions associated with the proposed campground/San Luis Creek Day Use Area improvements would not exceed the SJVAPCD thresholds without mitigation.

Construction and operation of the Modified Project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Off-road construction equipment would be operating at various portions of the site at any one time. In addition, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Construction of the Modified Project would result in a less-than-significant increase in localized NO_x emissions after implementation of mitigation (see Table 3.2-11). Operation of the proposed campground/improved San Luis Creek Day Use Area would result in a minimal increase in localized NO_x emissions without mitigation. Therefore, the Modified Project is not anticipated to result in substantial NO_2 emissions or the potential health effects associated with NO_2.

Regarding localized CO from the Modified Project, although the daily emissions of CO from construction would exceed 100 pounds per day after mitigation, the ambient air quality assessment determined that the Modified Project's CO emissions would not contribute to significant health effects associated with this pollutant (see Table 3.2-11). In regard to operations, CO tends to be a localized impact associated with congested intersections. As discussed in Section 3.7 of the SEIR, the Modified Project would result in minimal new traffic trips and would not result in reductions in LOS at affected intersections to E or F or substantially worsen any intersections already operating at LOS F. All of the existing intersection and roadway LOS would remain the same after the addition of traffic volumes from operation of the Modified Project. Furthermore, based on the structural design of the intersections and roadways that would have the maximum hourly traffic volumes (i.e., State Route 33/ Interstate 5 West Junction, access road to Romero Visitor Center/State Route 152, and Basalt Road/State Route 152), there are no proximate sidewalks or other facilities for general public access. Thus, the Modified Project would not expose sensitive receptors to substantial concentrations or the potential health effects associated with CO.

Construction and operation of the Modified Project would also not exceed thresholds for PM_{10} or $PM_{2.5}$, and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the SJVAB from coming into attainment for these pollutants. Although PM_{10} and $PM_{2.5}$ emissions from construction would be less than significant before mitigation, the implementation of Mitigation Measures AQ-1, AQ-2, and AQ-3 would further reduce exhaust and fugitive dust particulate emissions by requiring lower emitting construction equipment (AQ-1), newer on-road trucks (AQ-2), and implementation of a fugitive dust control plan with associated measures (AQ-3). Due to the less-than-significant contribution of PM_{10} and $PM_{2.5}$ during construction and operation, it is not anticipated that the Modified Project would result in potential health effects related to particulate matter.

The California Supreme Court's *Sierra Club v. County of Fresno* (2018) 6 Cal. 5th 502 decision (referred to herein as the Friant Ranch decision) (issued on December 24, 2018) addresses the need to correlate mass emission values for criteria air pollutants to specific health consequences and contains the following direction from the California Supreme Court: "The Environmental Impact Report (EIR) must provide an adequate analysis to inform the public how its bare numbers translate to create potential adverse impacts or it must explain what the agency *does* know and why, given existing scientific constraints, it cannot translate potential health impacts further." (Italics original.) (*Sierra Club v. County of Fresno* 2018.) Currently, the SJVAPCD, CARB, and EPA have not approved a quantitative method to reliably, meaningfully, and consistently translate the mass emission estimates for the criteria air pollutants resulting from the Modified Project to specific health effects. In addition, there are numerous scientific and technological complexities associated with correlating criteria air pollutant emissions from an individual project to specific health effects or potential additional nonattainment days.

In connection with the judicial proceedings culminating in issuance of the Friant Ranch decision, the South Coast Air Quality Management District (SCAQMD) and the SJVAPCD filed amicus briefs attesting to the extreme difficulty of correlating an individual project's criteria air pollutant emissions to specific health impacts. Both SJVAPCD and SCAQMD have among the most sophisticated air quality modeling and health impact evaluation capabilities of the air districts in California. The key, relevant points from SCAQMD and SJVAPCD briefs are summarized herein.

In requiring a health impact type of analysis for criteria air pollutants, it is important to understand how O_3 and particulate matter (PM) are formed, dispersed, and regulated. The formation of O_3 and PM in the atmosphere, as secondary pollutants,[8] involves complex chemical and physical interactions of multiple pollutants from natural and anthropogenic sources. The O_3 reaction is self-perpetuating (or catalytic) in the presence of sunlight because NO_2 is photochemically reformed from nitric oxide. In this way, O_3 is controlled by both NO_x and ROG emissions (NRC 2005). The complexity of these interacting cycles of pollutants means that incremental decreases in one emission may not result in proportional decreases in O_3 (NRC 2005). Although these reactions and interactions are well understood, variability in emission source operations and meteorology creates uncertainty in the modeled O_3 concentrations to which downwind populations may be exposed (NRC 2005). Once formed, O_3 can be transported long distances by wind, and due to atmospheric transport, contributions of precursors from the surrounding region can also be important (EPA 2008b). Because of the complexity of O_3 formation, a specific tonnage amount of ROG or NO_X emitted in a particular area does not equate to a particular concentration of O_3 in that area (SJVAPCD 2015c).

PM can be divided into two categories: directly emitted PM and secondary PM. Secondary PM, like O_3, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as SO_x and NO_x (SJVAPCD 2015c). Because of the complexity of secondary PM formation, including the potential to be transported long distances by wind, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an

8 Air pollutants formed through chemical reactions in the atmosphere are referred to as secondary pollutants.

equivalent concentration of secondary PM in that area (SJVAPCD 2015c). This is especially true for individual projects, like the Modified Project, where project-generated criteria air pollutant emissions are not derived from a single "point source," but from construction equipment and mobile sources (passenger cars and trucks) driving to, from, and around the Modified Project site.

Another important technical nuance is that health effects from air pollutants are related to the concentration of the air pollutant that an individual is exposed to, not necessarily the individual mass quantity of emissions associated with an individual project. For example, health effects from O_3 are correlated with increases in the ambient level of O_3 in the air a person breathes (SCAQMD 2015). However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient O_3 levels over an entire region (SCAQMD 2015). The lack of link between the tonnage of precursor pollutants and the concentration of O_3 and $PM_{2.5}$ formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects; rather, it is the concentration of resulting O_3 that causes these effects (SJVAPCD 2015c). Indeed, the ambient air quality standards, which are statutorily required to be set by EPA at levels that are requisite to protect the public health, are established as concentrations of O_3 and $PM_{2.5}$ and not as tonnages of their precursor pollutants (EPA 2018b). Because the ambient air quality standards are focused on achieving a particular concentration region-wide, the tools and plans for attaining the ambient air quality standards are regional in nature. For CEQA analyses, project-generated emissions are typically estimated in pounds per day or tons per year and compared to mass daily or annual emission thresholds. While CEQA thresholds are established at levels that the air basin can accommodate without affecting the attainment date for the ambient air quality standards, even if a project exceeds established CEQA significance thresholds, this does not mean that one can easily determine the concentration of O_3 or PM that will be created at or near the Modified Project site on a particular day or month of the year, or what specific health impacts will occur (SJVAPCD 2015c).

In regard to regional concentrations and air basin attainment, the SJVAPCD emphasized that attempting to identify a change in background pollutant concentrations that can be attributed to a single project, even one as large as the entire Friant Ranch Specific Plan, is a theoretical exercise. The SJVAPCD brief noted that it "would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch Project may have" (SJVAPCD 2015c). The situation is further complicated by the fact that background concentrations of regional pollutants are not uniform either temporally or geographically throughout an air basin, but are constantly fluctuating based upon meteorology and other environmental factors. SJVAPCD noted that the currently available modeling tools are equipped to model the impact of all emission sources in the SJVAB on attainment (SJVAPCD 2015c). The SJVAPCD brief then indicated that, "Running the photochemical grid model used for predicting O_3 attainment with the emissions solely from the Friant Ranch Project (which equate to less than 0.1% of the total NO_x and VOC in the Valley) is not likely to yield valid information given the relative scale involved" (SJVAPCD 2015c).

SCAQMD and SJVAPCD have indicated that it is not feasible to quantify project-level health impacts based on existing modeling (SCAQMD 2015; SJVAPCD 2015c). Even if a metric could be calculated, it would not be reliable because the models are equipped to model the impact of all emission sources in an air basin on attainment and would likely not yield valid information or a measurable increase in O_3 concentrations sufficient to accurately quantify O_3-related health impacts for an individual project.

Nonetheless, following the Supreme Court's Friant Ranch decision, some EIRs where estimated criteria air pollutant emissions exceeded applicable air district thresholds have included a quantitative analysis of potential project-generated health effects using a combination of a regional photochemical grid model[9] and the EPA Benefits

9 The first step in the publicly available HIAs includes running a regional photochemical grid model, such as the Community Multiscale Air Quality model or the Comprehensive Air Quality Model with extensions to estimate the increase in concentrations of O_3 and $PM_{2.5}$ as a result of project-generated emissions of criteria and precursor pollutants. Air districts, such as the SCAQMD,

Mapping and Analysis Program (BenMAP or BenMAP–Community Edition).[10] To date, the publicly available health impact assessments (HIAs) typically present results in terms of an increase in health incidences and/or the increase in background health incidence for various health outcomes resulting from the project's estimated increase in concentrations of O_3 and $PM_{2.5}$, and have each concluded that the potential health impacts are negligible and potentially within the models' margin of error.[11]

As explained in the SJVAPCD brief and noted previously, running the photochemical grid model used for predicting O_3 attainment with the emissions solely from an individual project like the Friant Ranch Project or the Modified Project is not likely to yield valid information given the relative scale involved. Accordingly, additional work in the industry and, more importantly, air district participation is needed to develop a more meaningful analysis to correlate project-level mass criteria air pollutant emissions and health effects for decision makers and the public. Furthermore, at the time of writing, no HIA has concluded that health effects estimated using the photochemical grid model and BenMAP approach are substantial, provided that the estimated project-generated incidences represent a very small percentage of the number of background incidences, potentially within the models' margin of error.

Of importance, construction and operational emissions of the Modified Project elements would not exceed the SJVAPCD thresholds of significance when summed with the Approved Project emissions after implementation of Mitigation Measures AQ-1, AQ-2, and AQ-3 to reduce construction emissions. As such, the Modified Project overall would not violate any ambient air quality standard or contribute substantially to an existing or projected violation of any ambient air quality standard. This impact would be **less than significant after mitigation**.

Comparison to 2019 EIS/EIR

The additional project components analyzed above would result in less-than-significant impacts with mitigation incorporated and therefore impacts of the Modified Project would not result in a significant increase in the severity of impacts as determined in the 2019 EIS/EIR. Impacts of the Modified Project would remain less than significant with mitigation incorporated (see Section 3.2.5).

Threshold 5

Would the Modified Project create objectionable odors affecting a substantial number of people?

2019 EIS/EIR Impact Determination	Modified Project Impact Determination	New Significant Increase in Impact Severity?
Less than Significant	Less than Significant	No

use photochemical air quality models for regional air quality planning. These photochemical models are large-scale air quality models that simulate the changes of pollutant concentrations in the atmosphere using a set of mathematical equations characterizing the chemical and physical processes in the atmosphere (EPA 2017).

10 After estimating the increase in concentrations of O_3 and $PM_{2.5}$, the second step in the five examples includes use of BenMAP or BenMAP–Community Edition to estimate the resulting associated health effects. BenMAP estimates the number of health incidences resulting from changes in air pollution concentrations (EPA 2018c). The health impact function in BenMAP–Community Edition incorporates four key sources of data: (i) modeled or monitored air quality changes, (ii) population, (iii) baseline incidence rates, and (iv) an effect estimate. All of the five example HIAs focused on O_3 and $PM_{2.5}$.

11 The following CEQA documents included a quantitative HIA to address Friant Ranch: (1) California State University Dominguez Hills 2018 Campus Master Plan EIR (CSUDH 2019), (2) March Joint Powers Association K4 Warehouse and Cactus Channel Improvements EIR (March JPA 2019), (3) Mineta San Jose Airport Amendment to the Airport Master Plan EIR (Ramboll 2019a), (4) City of Inglewood Basketball and Entertainment Center Project EIR (City of Inglewood 2019), and (5) San Diego State University Mission Valley Campus Master Plan EIR (Ramboll 2019b).

Section 41700 of the California Health and Safety Code and SJVAPCD Rule 4102 (Public Nuisance) prohibit emissions from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property. The occurrence and severity of potential odor impacts depends on numerous factors: the nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying, cause distress among the public, and generate citizen complaints.

Campground Construction and Day Use Area Improvements

Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the proposed campground and San Luis Creek Day Use Area improvements. Potential odors produced during proposed construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the Modified Project site and generally occur at magnitudes that would not affect substantial numbers of people.

Regarding long-term operations, as identified in Table 3.2-5, land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding facilities (SJVAPCD 2015a). Construction of the proposed campground and San Luis Creek Day Use Area improvements would not result in the creation of a land use that is commonly associated with offensive odors. In addition, there are no existing sensitive receptors in close proximity to the proposed campground or day use area. Therefore, this element of the Modified Project would not result in odor emissions and the impact would be **less than significant.**

Changes in Borrow Area Location

Based on the short-term duration of construction activities associated with the additions to the contractor work area and the substantial distance to existing sensitive receptors, potential odors associated with this element of the Modified Project would be **less than significant.** This element of the Modified Project would not result in long-term operations or odors.

Minor Additions to Contractor Work Area

Based on the short-term duration of construction activities associated with the additions to the contractor work area and the substantial distance to existing sensitive receptors, potential odors associated with this element of the Modified Project would be **less than significant.** This element of the Modified Project would not result in long-term operations or odors.

Additional Construction Assumptions

As noted in Chapter 2 of this SEIR, overall, the additional construction assumptions are described for clarification purposes in the SEIR. Additionally, the campground construction and day use area improvements element of the Modified Project was discussed above. These elements of the Modified Project would not result in odor emissions and the impact would be **less than significant.**

Summary

In summary, because the Approved Project would not result in substantial odors, and based on the above considerations for elements of the Modified Project, the Modified Project overall would not create objectionable odors affecting a substantial number of people. This impact would be **less than significant.**

Comparison to 2019 EIS/EIR

The additional project components analyzed above would result in less-than-significant impacts and therefore impacts of the Modified Project would not result in a significant increase in the severity of impacts as determined in the 2019 EIS/EIR. Impacts of the Modified Project would remain less than significant.

3.2.5 Mitigation Measures

The following mitigation measures were identified in the 2019 EIS/EIR for the Approved Project and have been incorporated herein for the Modified Project where applicable and revised where appropriate.

AQ-1 **(Same as AQ-1 in 2019 EIS/EIR): Reduce Emissions from Off-Road Construction Equipment by Using Tier 4 Construction Equipment.** Impacts on air quality from construction activities will be reduced by using construction equipment compliant with the Tier 4 emission standards for off-road diesel engines instead of the fleet average for the San Joaquin Valley Air Basin. Records will be maintained by the construction contractor that demonstrate that actual emissions would not exceed the SJVAPCD's significance criteria and would be submitted to Reclamation monthly.

If NOx emissions are forecasted to exceed thresholds, then changes will be made so that the threshold is not exceeded, or work will be stopped.

AQ-2 **(Same as AQ-2 in 2019 EIS/EIR): Reduce Exhaust Emissions from On-Road Trucks.** All haul trucks, vendor trucks, and other heavy-heavy duty trucks operating on site with on-road engines will meet model year 2015 or better emission standards.

AQ-3 **(Same as AQ-3 in 2019 EIS/EIR): Implement Best Available Mitigation Measures for Construction Phase.** As required by the SJVAPCD, the project must apply the following best available mitigation measures for the construction phase:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.

- When materials are transported off site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. *(The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)*
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement mitigation measures to prevent carryout and trackout.

3.2.6 Level of Significance After Mitigation

The Modified Project would result in a potentially significant impact with respect to conflicting with or obstructing implementation of the applicable air quality plan prior to mitigation. Mitigation Measures AQ-1, AQ-2, and AQ-3, which require exhaust and fugitive dust controls, would reduce impacts to a level below significance.

The Modified Project would result in a potentially significant impact with respect to violating ambient air quality standards or contributing substantially to an existing or projected violation. Mitigation Measures AQ-1, AQ-2, and AQ-3, which require exhaust and fugitive dust controls, would reduce impacts to a level below significance.

Construction and operation of the Modified Project elements would result in a minimal increase in criteria air pollutant emissions and would not exceed the applicable SJVAPCD annual thresholds when summed with the Approved Project emissions after implementation of Mitigation Measures AQ-1, AQ-2, and AQ-3 to reduce construction emissions. However, other cumulative projects in the SJVAB would also result in emissions concurrently with the Modified Project, including the reservoir expansion project, which would result in emissions of NO_x and PM_{10} that exceed the SJVAPCD thresholds after mitigation and would be constructed within the same general area and overlapping time period as the Modified Project. Therefore, the construction and operational emissions generated by the Modified Project would contribute to a cumulatively significant impact. As such, this impact would be significant and unavoidable.

The Modified Project would result in potentially significant impacts with respect to exposing sensitive receptors to substantial pollutant concentrations, specifically criteria air pollutants, during construction. Implementation of Mitigation Measures AQ-1, AQ-2, and AQ-3, which require exhaust and fugitive dust control, would reduce impacts to a level below significance. TAC exposure and potential for Valley Fever would be less than significant without additional mitigation.

The Modified Project would result in less-than-significant impacts with respect to creating objectionable odors affecting a substantial number of people. No mitigation is required.