3.2 Air Quality

This section of the Draft EIR evaluates potential impacts to air quality associated with implementation of the proposed Golden State Natural Resources Forest Resiliency Demonstration Project (proposed project or project). This section describes the existing air quality conditions at feedstock source locations (Sustainable Forest Management Projects), proposed pellet processing facility sites in Northern California (Lassen Facility) and the Central Sierra Nevada foothills (Tuolumne Facility), and the export terminal at the Port of Stockton, and evaluates the potential for project-related air quality impacts, considering proposed project design features (PDFs) and site design features (SDFs) that could reduce or eliminate associated impacts.

Scoping comments were received regarding air quality in response to the Notice of Preparation (NOP) (see Appendix A). The air quality related comments included concerns about criteria air pollutant emissions and toxic air contaminants (TACs) associated with the construction and operational "lifecycle" (i.e., from harvesting, processing, feedstock transport and storage, pellet production, rail transport, port operations, overseas transport, and combustion of the pellets to make electricity) of the proposed project. Concerns related to criteria air pollutants generated during construction and operation are addressed in Impacts AQ-1 and AQ-2 within Section 3.2.4.2. Concerns related to TACs are addressed in Impact AQ-3 within Section 3.2.4.2. Concerns were also related to potential odors associated with the pellet facilities and storage of pellets and feedstocks, which are addressed in Impact AQ-4 within Section 3.2.4.2. Finally, concerns pertaining to potential air pollution impacts at communities of color and low-income communities were received, which are addressed in Impact AQ-3 within Section 3.2.4.2.

3.2.1 Environmental Setting

3.2.1.1 Pollutants and Effects

3.2.1.1.1 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards (AAQS), or criteria, for outdoor concentrations to protect public health. The national and California 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 less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs.[1]

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and volatile organic compounds (VOCs), also referred to as reactive organic gases (ROGs). 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

1 The descriptions of the criteria air pollutants and associated health effects are based on the U.S. Environmental Protection Agency's "Criteria Air Pollutants" (EPA 2024a), as well as the California Air Resources Board's "Glossary" (CARB 2024a).

speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric O_3) and at the Earth's surface in the troposphere (ground-level O_3).[2] 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 at levels typically observed in Southern California 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 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, thereby causing 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 on the effects of O_3 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.

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 (NO), which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers. NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections.

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 AAQS 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

2 The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

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 levels of exposure compared to children with lower exposure levels. 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.

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

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 parts per million [ppm]) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. Older people and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects.

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, both because they have increased baseline airflow resistance and because their SO_2-induced increase in airflow resistance is greater than 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}) consists of particulate matter that is 10 microns or less in diameter, which is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) consists of particulate matter that is 2.5 microns or less in diameter, which 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 VOCs.

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

Several adverse health effects have been associated with exposure to both $PM_{2.5}$ and PM_{10}. For $PM_{2.5}$, short-term exposures (up to 24-hour duration) 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.

Long-term exposure (months to years) 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.

Ultrafine Particulate Matter. Ultrafine particles (UFPs or $PM_{0.1}$) are particulate matter with a diameter less than 0.1 microns. While UFPs are a subset of regulated particulate matter, their exceptionally small size presents additional concerns related to regulation, accurate and reliable measurement, and health effects, as they can penetrate into regions of the human body that are not accessible to larger particles (Casuccio et. al. 2006, Marval and Tronville 2022, Kleeman et al. 2019). Predominant human-caused sources of UFPs include vehicle exhaust, stationary sources (diesel, natural gas, and biofuel combustion) such as power plants and factories, and biomass burning. There are additional indoor sources of UFP such as combustion (cooking), heating, and house cleaning (Marval and Tronville 2022). UFP also have toxic properties, possibly because they can transport metals, oxidized organic compounds, and other toxic substances, though epidemiological studies have been generally inconclusive (Kleeman et al. 2019). Observed effects in animal and human studies include respiratory and cardiovascular effects such as lung function changes, airway inflammation, enhanced allergic responses, vascular thrombogenic effects, altered endothelial function, altered heart rate and heart rate variability, accelerated atherosclerosis, and increased markers of brain inflammation (Health Effects Institute 2013, Schraufnagel 2020). Of importance, UFP is not estimated or evaluated separately from $PM_{2.5}$ in this analysis as neither CARB nor EPA have established separate AAQS, air districts have not established numeric thresholds for $PM_{0.1}$ or other guidance for evaluating $PM_{0.1}$ under CEQA, and industry standard emission estimator models do not include methodology for estimating $PM_{0.1}$ from land use projects.

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 phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout 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 (IQ) 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 and can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which 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 $PM_{2.5}$.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as reactive organic gases). 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 VOCs result from the formation of O_3 and its related health effects. High levels of VOCs 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 AAQS for VOCs as a group.

3.2.1.1.2 Non-criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. 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 the state of 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 non-carcinogenic effects. Non-carcinogenic 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. 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 1/70 the diameter of a human hair), and thus is a subset of $PM_{2.5}$. DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2022f). The 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, including 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 non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies. Those most vulnerable to non-cancer health effects are children, whose lungs are still developing, and older people, 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. When fungal spores are present, any activity that disturbs the soil, such as digging, grading, or other earth-moving operations, can cause the spores to become airborne and thereby increase the risk of exposure. The ecologic factors that appear to be most conducive to survival and replication of the spores are high summer temperatures, mild winters, sparse rainfall, and alkaline sandy soils.

The fungus is very prevalent in California's soils. Some of the California counties considered highly endemic for Valley Fever include Kern (264.9 per 100,000), Kings (111.0 per 100,000), Tulare (65.7 per 100,000), San Luis Obispo (51.5 per 100,000), Fresno (44.3 per 100,000), Madera (32.4 per 100,000), and Ventura (28.3 per 100,000), which accounted for 50.5% of the reported cases in 2022 (CDPH 2022). In contrast, in 2022 the statewide annual incident rate was 19.1 per 100,000 people.

None of the counties within the Lassen Feedstock area that Sustainable Forest Management Projects could take place are considered highly endemic areas for Valley Fever. However, Fresno County, Madera County, Tulare County, and Merced County are located within the Tuolumne Feedstock area, and therefore, Sustainable Forest Management Projects could take place in these counties.

Neither Lassen County, Tuolumne County, nor San Joaquin County, where the Lassen Facility, Tuolumne Facility, and Port of Stockton are respectively located, are considered highly endemic areas for Valley Fever. The latest report from the California Department of Public Health (CDPH) indicated that Lassen County had 3.4 cases per 100,000 people, Tuolumne County had 3.7 cases per 100,000 people, and San Joaquin County had 13.3 cases per 100,000 people (CDPH 2022).

Naturally Occurring Asbestos. Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers, with principal forms including chrysotile, crocidolite, amosite, tremolite, actinolite, and anthophyllite (OEHHA 2000). Naturally occurring asbestos (NOA) is found in some areas throughout California, most commonly where ultramafic rock or serpentinite rock is present, including in the Klamath Mountains and Coast Ranges. When construction activities occur in areas with NOA in the soils or rock, the asbestos fibers can become airborne and may be inhaled, which can cause chronic local inflammation and disrupt orderly cell division, both of which can facilitate the development of asbestosis (a noncancerous lung disease involving fibrotic scarring of the lungs) and cancer (OEHHA 2000). To address some of the health concerns associated with the possible exposure to NOA, CARB adopted two statewide Asbestos Airborne

Toxic Control Measures to prohibit the use of serpentine or ultramafic rock for unpaved surfaces and mitigate the dust emissions from grading, mining, and other construction activities (CARB 2017a).

Wildfire Smoke. Wildfire smoke is comprised of a mixture of gaseous pollutants (e.g., CO), TACs (e.g., polycyclic aromatic hydrocarbons [PAHs]), water vapor, and particle pollution (EPA 2023a). Particle pollution represents a main component of wildfire smoke and the principal public health threat. "Particle pollution" (also referred to as particles, particulate matter, or PM) is a general term for a mixture of solid and liquid droplets suspended in the air. There are many sources of particle pollution; the most common is combustion-related activities, such as wildfires. Because of the variety of sources, particles come in many sizes and shapes. Some particles are so small that they are only visible using an electron microscope. Particles can be made up of different components, including acids (e.g., sulfuric acid), inorganic compounds (e.g., ammonium sulfate, ammonium nitrate, and sodium chloride), organic chemicals, soot, metals, soil or dust particles, and biological materials (e.g., pollen and mold spores). There is evidence of an increase in the risk of both cardiovascular- and respiratory-related effects in response to wildfire smoke exposure, particularly as the intensity of wildfire smoke increases.

3.2.1.2 Sustainable Forest Management Projects

Meteorological and Topographical Conditions

In 2019, the Golden State Finance Authority (GSFA) and the U.S. Forest Service signed a Master Stewardship Agreement (MSA) for the general purpose of achieving resilient forests within U.S. Forest Service Region 5, which includes all of the 18 national forests located in California. Feedstock for manufacturing of wood pellets will be wood byproducts sourced from Sustainable Forest Management Projects such as hazardous fuel reduction projects, construction of shaded fuel breaks, and salvage harvests (see Chapter 2, Project Description, for a full description). While the MSA applies to the entirety of Region 5, only Sustainable Forest Management Projects within the Working Area described in Chapter 2.4 are contemplated under the proposed project. The feedstock would originate from private, state, tribal, and federal timberlands located within these areas. In addition, the Working Area includes public and private forested lands in Nevada and Oregon, including parts of Regions 4 and 6 of the USFS in western Nevada and southern Oregon, respectively.[3]

California's climate exhibits a Mediterranean pattern, marked by hot, arid summers and cool, wet winters. California includes a diverse range of geographical conditions, including oceans, valleys, mountains, and deserts. These geographic features play a crucial role in trapping pollutants within a certain region and preventing their dispersion, resulting in an air basin.

Feedstock activity within the Northern feedstock boundary (Lassen Feedstock area) may occur within the Northeast Plateau Air Basin, North Coast Air Basin, Sacramento Valley Air Basin, and Mountain Counties Air Basin. Feedstock activity within Southern feedstock boundary (Tuolumne Feedstock area) may occur within the San Joaquin Valley Air Basin, Mountain Counties Air Basin, Sacramento Valley Air Basin, and Great Basin Valleys Air Basin (see Figure 3.2-1, Feedstock Areas – California Air Districts).

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3 As set forth in Section 2.4 within Chapter 2, any feedstock acquisition activities occurring in Oregon or Nevada will be required to undergo environmental review under NEPA or under a law of the applicable state requiring preparation of a document containing essentially the same points of analysis as NEPA. Consequently, those activities are not separately discussed in detail here; however, the nature of those activities, the associated emissions, and their effects upon air quality within and outside the state, are identical to Sustainable Forest Management Projects occurring within California, and those aspects of the discussion in this chapter are equally applicable to those activities.

Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across the state. The data collected at these locations inform the attainment or nonattainment designation of counties and air basins. Sustainable forest management project activities implemented under the project would occur within every air basin described above, as such, there would be a high degree of variation in how the emissions of these projects would affect the ambient concentrations of criteria air pollutants within an air basin. For the reasons stated above (e.g., topography, meteorology, emissions sources, location), ambient concentrations of criteria air pollutants differ between air basins.

Attainment Designation

Pursuant to the 1990 federal Clean Air Act amendments, EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as "attainment" for that pollutant. If an area exceeds the standard, the area is classified as "nonattainment" for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are re-designated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as "attainment" or "nonattainment," but based on CAAQS rather than the NAAQS. Table 3.2-1 depicts the current attainment status of the all California counties located within the Working Area of the Lassen Facility or the Tuolumne Facility in respect to the NAAQS and CAAQS.

Table 3.2-1. Attainment Status of Counties Located Within the Working Area of the Lassen and Tuolumne Facilities

County	Ozone		Nitrogen Dioxide		Carbon Monoxide		Sulfur Dioxide		PM_{10}		$PM_{2.5}$		Lead		Sulfates		Hydrogen Sulfide		Vinyl Chloride		VSP	
	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS
Alpine	U	U/A	A	U/A	U	U/A	A	U/A	N	U	A	U/A	A	U/A	A	/	U	/	U	/	U	/
Amador	N	N	A	U/A	U	U/A	A	U/A	U	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Butte	N	N	A	U/A	A	U/A	A	U/A	N	U	N	U/A	A	U/A	A	/	U	/	U	/	U	/
Calaveras	N	N	A	U/A	U	U/A	A	U/A	N	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
El Dorado[a]	N	N	A	U/A	U	U/A	A	U/A	N	U	U	N	A	U/A	A	/	U	/	U	/	U	/
Fresno	N	N	A	U/A	A	U/A	A	U/A	N	A	N	N	A	U/A	A	/	U	/	U	/	U	/
Lassen	A	U/A	A	U/A	U	U/A	A	U/A	U	U	A	U/A	A	U/A	A	/	U	/	U	/	U	/
Madera	N	N	A	U/A	U	U/A	A	U/A	N	A	N	N	A	U/A	A	/	U	/	U	/	U	/
Mariposa	N	N	A	U/A	U	U/A	A	U/A	U	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Merced	N	N	A	U/A	U	U/A	A	U/A	N	A	N	N	A	U/A	A	/	U	/	U	/	U	/
Modoc	A	U/A	A	U/A	U	U/A	A	U/A	U	U	A	U/A	A	U/A	A	/	U	/	U	/	U	/
Mono	N	U/A	A	U/A	A	U/A	A	U/A	N	N	A	U/A	A	U/A	A	/	A	/	U	/	U	/
Nevada	N	N	A	U/A	U	U/A	A	U/A	N	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Placer[b]	N	N	A	U/A	U	U/A	A	U/A	N	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Plumas	U	U/A	A	U/A	A	U/A	A	U/A	N	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Sacramento	N	N	A	U/A	A	U/A	A	U/A	N	A	A	N	A	U/A	A	/	U	/	U	/	U	/
San Joaquin[c]	N	N	A	U/A	A	U/A	A	U/A	N	A	N	N	A	U/A	A	/	U	/	U	/	U	/
Shasta	N	U/A	A	U/A	U	U/A	A	U/A	A	U	A	U/A	A	U/A	A	/	U	/	U	/	U	/
Sierra	U	U/A	A	U/A	U	U/A	A	U/A	N	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Siskiyou	A	U/A	A	U/A	U	U/A	A	U/A	A	U	A	U/A	A	U/A	A	/	U	/	U	/	U	/
Stanislaus	N	N	A	U/A	A	U/A	A	U/A	N	A	N	N	A	U/A	A	/	U	/	U	/	U	/
Sutter	N	U/A	A	U/A	A	U/A	A	U/A	N	U	N	U/A	A	U/A	A	/	U	/	U	/	U	/

Table 3.2-1. Attainment Status of Counties Located Within the Working Area of the Lassen and Tuolumne Facilities

County	Ozone		Nitrogen Dioxide		Carbon Monoxide		Sulfur Dioxide		PM_{10}		$PM_{2.5}$		Lead		Sulfates		Hydrogen Sulfide		Vinyl Chloride		VSP	
	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS
Tehama	N	U/A	A	U/A	U	U/A	A	U/A	N	U	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Trinity	A	U/A	A	U/A	U	U/A	A	U/A	A	U	A	U/A	A	U/A	A	/	U	/	U	/	U	/
Tuolumne	T	N	A	U/A	A	U/A	A	U/A	U	A	U	U/A	A	U/A	A	/	U	/	U	/	U	/
Yuba	N	U/A	A	U/A	U	U/A	A	U/A	N	U	N	U/A	A	U/A	A	/	U	/	U	/	U	/

Source: EPA 2024b; CARB 2024b

Notes: N = nonattainment; A = attainment; U = unclassified; U/A = unclassifiable/attainment; T = nonattainment/transitional; / = no data or not applicable

[a] The eastern portion of El Dorado County (Lake Tahoe Air Basin) is in attainment for the CAAQS and NAAQS for ozone, $PM_{2.5}$, and PM_{10}; however, the western portion (Mountain Counties Air Basin) is in nonattainment for ozone and unclassified for PM_{10}. A fraction of the County located in the Mountain Counties Air Basin is also in nonattainment for the $PM_{2.5}$ NAAQS.

[b] The eastern portion of Placer County (Lake Tahoe Air Basin) is in attainment for the CAAQS and NAAQS for ozone; however, the western portion (Sacramento Valley Air Basin and Mountain Counties Air Basin) is in nonattainment for ozone. The far western portion (Sacramento Valley Air Basin) and far eastern portion (Lake Tahoe Air Basin) is in attainment the $PM_{2.5}$ CAAQS, and the middle portion (Mountain Counties Air Basin) is designated unclassified for the $PM_{2.5}$ CAAQS. The far western portion (Sacramento Valley Air Basin) is also in nonattainment for the $PM_{2.5}$ NAAQS.

[c] The western portion (San Joaquin Valley Air Basin) is in nonattainment. The San Joaquin Valley Air Basin is in attainment for the PM_{10} and $PM_{2.5}$ NAAQS.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, older adults, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air-pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air-pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005).

Each air district defines sensitive receptors differently; however, there are general commonalities between definitions that generally match how the State defines sensitive receptors (e.g., facilities that house or attract children, older adults, people with illnesses, hospitals, schools, convalescent facilities, and residential areas). Feedstock activities would occur across the jurisdiction of 17 air districts; six of these districts specifically define sensitive receptors as follows:

- Sacramento Metropolitan AQMD, San Joaquin Valley APCD, Shasta County AQMD, El Dorado APCD: These four air districts define sensitive receptors identically as "facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors" (Sacramento Metropolitan AQMD 2009, San Joaquin Valley APCD 2000, Shasta County AQMD 2003, El Dorado County APCD 2002)
- Butte County AQMD defines sensitive receptors as "people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units" (Butte County AQMD 2024)
- Tehama County APCD defines a sensitive receptor as "a location where human populations, especially children, seniors, or sick persons are found, and there is reasonable expectation of continuous human exposure according to the averaging period for the AAQS (e.g., 24-hour, 8-hour). These typically include residences, hospitals, and schools" (Tehama County APCD 2015).

Because feedstock activity would occur over various areas and the specific locations for each Sustainable Forest Management Project have not yet been determined, the nearest sensitive receptor for any particular feedstock activity cannot be identified at this time; however, it is reasonable to anticipate that residential and other sensitive land uses may be nearby roadways where feedstock transport would occur. Within the forests where feedstock would be gathered, sensitive receptors are not anticipated be within close proximity.

3.2.1.3 Northern California (Lassen Facility) Site

Meteorological and Topographical Conditions

Northeast Plateau Air Basin

The Northeast Plateau Air Basin (NEPAB) is located in the northeastern most corner of California and encompasses Siskiyou County, Modoc County, and Lassen County, where the Lassen Facility is located. The topography of the NEPAB is rugged and elevated, including the Klamath Mountains, the Cascade Mountains, and the Modoc Plateau. The prevalence of mountains and hills in the region results in a wide range of climate conditions, including distinct precipitation, temperature, and wind differences from other air basins in California. The region experiences typical seasonal conditions, such as wet and cold winters and hot and dry summers. With only approximately 80,000 residents across 3 counties, the NEPAB is sparsely populated compared to other air basins in California, and has few weather and air quality monitoring stations. Similar to other rural areas, the region does not suffer from high concentrations of the criteria air pollutants associated with major urban centers, such as ozone and nitrogen oxides, but instead deals more with the particulate emissions from dust and wood smoke.

Local Ambient Air Quality

There are no monitoring stations within Lassen County, but neighboring air districts monitor local ambient air quality in the vicinity of the Lassen Facility and the NEPAB. Due to the lack of monitoring sites in the vicinity of the Lassen Facility, the available local ambient air quality may not be truly representative of the site. 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. The most recent background ambient air quality data from 2021 to 2023 are presented in Table 3.2-2.

The Yreka monitoring station, located at 530 Foothill Drive, Yreka, California, is the air quality monitoring station nearest to the facility measuring O_3 and $PM_{2.5}$, located approximately 87 miles northwest of the facility. The Yreka monitoring station is in Siskiyou County, which is in attainment for O_3 and $PM_{2.5}$, as is Lassen County. The Chico monitoring station, located at 984 East Avenue, Chico, California, is the nearest monitoring station to the facility measuring NO_2 and CO, located approximately 102 miles southwest of the facility. The Chico monitoring station is in Butte County, which is in attainment for NO_2 and CO, as is Lassen County. The Eureka monitoring station, located at 717 South Avenue, Eureka, California, is the air quality monitoring station nearest to the facility measuring SO_2 concentrations, located approximately 159 miles west of the facility. The Eureka monitoring station is in Humboldt County, which is in attainment for SO_2, as is Lassen County. The Shasta Lake-La Mesa Avenue monitoring station, located at 4066 La Mesa Avenue, Shasta Lake, California is the nearest monitoring station to the facility measuring PM_{10}, located approximately 69 miles west of the facility. The Shasta Lake-La Mesa monitoring station is in Shasta County, which is in attainment for PM_{10}, as is Lassen County. The number of days exceeding the AAQS is also shown in Table 3.2-2.

Table 3.2-2. Lassen Facility Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2021	2022	2023	2021	2022	2023
Ozone (O_3)[1]									
Maximum 1-hour concentration	ppm	California	0.09	0.077	0.087	0.070	0	0	0
Maximum 8-hour concentration	ppm	California	0.070	0.070	0.071	0.066	0	1	0
		National	0.070	0.070	0.070	0.066	0	0	0
Nitrogen Dioxide (NO_2)[2]									
Maximum 1-hour concentration	ppm	California	0.18	0.031	0.029	0.031	0	0	0
		National	0.100	0.032	0.030	0.031	0	0	0

Table 3.2-2. Lassen Facility Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2021	2022	2023	2021	2022	2023
Annual concentration	ppm	California	0.030	0.005	0.005	ND	—	—	---
		National	0.053	0.005	0.005	0.005	—	—	---
Carbon Monoxide (CO)[3]									
Maximum 1-hour concentration	ppm	California	20	ND	ND	ND	ND	ND	ND
		National	35	1.8	1.6	1.7	0	0	0
Maximum 8-hour concentration	ppm	California	9.0	ND	ND	ND	ND	ND	ND
		National	9	1.5	1.2	1.3	0	0	0
Sulfur Dioxide (SO_2)[4]									
Maximum 1-hour concentration	ppm	National	0.075	0.001	0.001	0.001	0	0	0
Maximum 24-hour concentration	ppm	National	0.14	0.001	0.001	0.001	0	0	0
Annual concentration	ppm	National	0.030	<0.001	<0.001	<0.001	—	—	---
Coarse Particulate Matter (PM_{10})[5,a]									
Maximum 24-hour concentration	$\mu g/m^3$	California	50	112.4	ND	ND	ND (3)	ND (0)	ND (0)
		National	150	116.6	ND	ND	ND (0)	ND (0)	ND (0)
Annual concentration	$\mu g/m^3$	California	20	ND	ND	ND	—	—	—
Fine Particulate Matter ($PM_{2.5}$)[1,a]									
Maximum 24-hour concentration	$\mu g/m^3$	National	35	134.6	302.5	235.1	32.5 (30)	8.5 (7)	17.8 (17)
Annual concentration	$\mu g/m^3$	California	12	14.7	ND	11.1	—	—	—
		National	9.0	14.5	9.4	10.9	—	—	—

Sources: CARB 2024c; EPA 2024c.

1 CARB 2024c, Yreka-Foothill Drive monitoring station
2 CARB 2024c, Chico-East Avenue monitoring station
3 EPA 2024c, Chico-East Avenue monitoring station
4 EPA 2024c, Eureka-South Avenue monitoring station
5 CARB 2024c, Shasta Lake 4066-La Mesa Avenue monitoring station

Notes: ppm = parts per million by volume; — = not available; $\mu g/m^3$ = micrograms per cubic meter; ND = insufficient data available to determine the value; <0.001 designates values less than 0.005.

Data represent the highest concentrations experienced over a given year.

Exceedances of national and California standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed national or California standards during the years shown. There is no national standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a California 24-hour standard for $PM_{2.5}$.

a Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

Attainment Designation

Table 3.2-1 (Section 3.2.1.2) presents the current attainment status of Lassen County with respect to the NAAQS and CAAQS. In summary, Lassen County is designated as an attainment or unclassified area for all national and California criteria air pollutant standards.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, older adults, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air-pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air-pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005).

The Lassen County APCD does not have its own definition of sensitive receptors; however, there is general commonalities between definitions that generally match how the State defines sensitive receptors (e.g., facilities that house or attract children, older adults, people with illnesses, hospitals, schools, convalescent facilities, and residential areas).

The closest off-site sensitive receptor to the Lassen Facility is a residence located 184 feet to the west of the facility.

Environmental Conditions

CalEnviroScreen, SB 535, AB 1550, and AB 617

CalEnviroScreen is a mapping tool that helps identify California communities that are most affected by many sources of pollution, where people are often especially vulnerable to pollution's effects. CalEnviroScreen ranks census tracts in California based on potential exposures to pollutants, adverse environmental conditions, socioeconomic factors and the prevalence of certain health conditions. Data used in the CalEnviroScreen model come from national and state sources.

Disadvantaged communities in California pursuant to SB 535 are identified using CalEnviroScreen. These especially burdened communities are targets for investment funds from the state's Cap-and-Trade Program to improve public health, quality of life, and economic conditions.

Low-Income Communities pursuant to AB 1550 are census tracts with median household incomes at or below 80 percent of the statewide median income (CARB 2021a). AB 1550 directs investments to benefit these low-income communities.

Community Air Reduction Program Communities pursuant to AB 617 are 19 communities selected by CARB to participate in the program, whose focus is to reduce the impact of air pollution in vulnerable regions.

The Lassen Facility is not in a disadvantaged community pursuant to SB 535 (CalEPA 2022), nor is it a Community Air Protection Program pursuant to AB 617 (CARB 2023a). However, it is in a Low-Income Community pursuant to AB 1550 (CARB 2023b).

The Lassen Facility achieves a score of 19 on the CalEnviroScreen (OEHHA 2023). The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the State.

Healthy Places

The Healthy Places Index® (HPI) is a project of the Public Health Alliance of Southern California. The HPI is a powerful and easy-to-use data and policy platform created to advance health equity through open and accessible data. Neighborhood-by-neighborhood, the HPI maps data on social conditions that drive health—like education, job opportunities, clean air and water, and other indicators that are positively associated with life expectancy at birth. Community leaders, policymakers, academics, and other stakeholders use the HPI to compare the health and well-being of communities, identify health inequities and quantify the factors that shape health.

The Lassen Facility has an HPI score of 17.0 (Public Health Alliance of Southern California 2022). The maximum HPI score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

3.2.1.4 Central Sierra Nevada (Tuolumne Facility) Site

Meteorological and Topographical Conditions

Mountain Counties Air Basin

The Mountain Counties Air Basin (MCAB) is located in northern California, encompassing seven air districts and nine counties, including Tuolumne County where the Tuolumne Facility is located. The MCAB is a roughly 11,000 square mile basin along the northern Sierra Nevada Mountain Range and the border with Nevada. The topography in the MCAB is highly variable, ranging from 10,000 feet of elevation in the Sierra Nevada Mountains to hundreds of feet of elevation in the western portion of the basin near the Sacramento Valley. This topographical variation results in localized sets of climatic conditions, including large amounts of precipitation and extreme cold months in the winter in the Sierra Nevada range but warmer and drier conditions in the lower-lying regions of the basin. The mountainous topography of the basin precludes dispersion in certain areas, enabling the high concentration of criteria air pollutants; according to CARB, all the counties within the MCAB are designated as either in nonattainment, nonattainment-transitional, or unclassified for ozone and particulate matter both federally and at the state level. The susceptibility of the MCAB to the concentration of certain criteria air pollutants, such as ozone, particulate matter, and carbon monoxide, remains a focus in the collaboration efforts between the seven constituent air districts to monitor and continue to improve air quality in the region.

Local Ambient Air Quality

There is one monitoring station within Tuolumne County, and neighboring air districts monitor local ambient air quality in the vicinity of the Tuolumne Facility and the MCAB. Due to the lack of monitoring sites in the vicinity of the Tuolumne Facility, the available local ambient air quality is not truly representative of the site and may overestimate background concentrations. 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. The most recent background ambient air quality data from 2021 to 2023 are presented in Table 3.2-3.

The Sonora monitoring station, located at 251 S Barretta, Sonora, California, is the air quality monitoring station nearest to the Tuolumne Facility that measures O_3, located approximately 12 miles northwest of the Tuolumne Facility. The Sonora monitoring station is in Tuolumne County, which is in nonattainment-transitional for O_3. The Turlock monitoring station, located at 900 S Minaret Street, Turlock, California, is the nearest monitoring station to the facility that measures NO_2, located approximately 30 miles west of the facility. The Turlock monitoring station is in Stanislaus County, which is in attainment for NO_2, as is Tuolumne County. The Modesto monitoring station, located at 814 14th Street, Modesto, California, is the air quality monitoring station nearest to the facility that measures CO concentrations, located approximately 30 miles west of the facility. The Modesto monitoring station is in Stanislaus County, which is in attainment for CO, as is Tuolumne County. The Fresno monitoring station, located at 4727 N First Street, Fresno, California approximately 80 miles south of the facility was referenced for SO_2 concentrations. The Fresno monitoring station is in Fresno County, which is in attainment for SO_2, as is Tuolumne County. Lastly, the San Andreas monitoring station, located at 501 Gold Strike Road, San Andreas, California approximately 30 miles west of the facility was referenced for both PM_{10} and $PM_{2.5}$ concentrations. The San Andreas monitoring station is in Calaveras County, which is in nonattainment for PM_{10}, while Tuolumne County is unclassified for PM_{10}. Calaveras County is unclassified for $PM_{2.5}$, as is Tuolumne County. The number of days exceeding the AAQS is also shown in Table 3.2-3.

Table 3.2-3. Tuolumne Facility Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2021	2022	2023	2021	2022	2023
Ozone (O_3)[1]									
Maximum 1-hour concentration	ppm	California	0.09	0.097	0.089	0.086	1	0	0
Maximum 8-hour concentration	ppm	California	0.070	0.081	0.074	0.075	3	1	2
		National	0.070	0.081	0.073	0.074	2	1	2
Nitrogen Dioxide (NO_2)[2]									
Maximum 1-hour concentration	ppm	California	0.18	0.040	0.045	0.047	0	0	0
		National	0.100	0.040	0.045	0.047	0	0	0
Annual concentration	ppm	California	0.030	0.006	0.008	0.007	—	—	—
		National	0.053	0.007	0.009	0.008	—	—	—
Carbon Monoxide (CO)[3]									
Maximum 1-hour concentration	ppm	California	20	ND	ND	ND	ND	ND	ND
		National	35	2.1	1.8	4.6	0	0	0
Maximum 8-hour concentration	ppm	California	9.0	ND	ND	ND	ND	ND	ND
		National	9	1.5	1.5	1.4	0	0	0

Table 3.2-3. Tuolumne Facility Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2021	2022	2023	2021	2022	2023
Sulfur Dioxide (SO_2)[4]									
Maximum 1-hour concentration	ppm	National	0.075	0.008	0.003	0.005	0	0	0
Maximum 24-hour concentration	ppm	National	0.14	0.003	0.001	0.002	0	0	0
Annual concentration	ppm	National	0.030	<0.001	<0.001	<0.001	—	—	—
Coarse Particulate Matter (PM_{10})[5,a]									
Maximum 24-hour concentration	µg/m^3	California	50	116.1	39.9	42.4	8.0 (8)	0.0 (0)	0.0 (0)
		National	150	121.4	43.4	43.8	0.0 (0)	0.0 (0)	0.0 (0)
Annual concentration	µg/m^3	California	20	19.8	12.1	ND	—	—	—
Fine Particulate Matter ($PM_{2.5}$)[5,a]									
Maximum 24-hour concentration	µg/m^3	National	35	94.3	25.9	29.3	7.0 (7)	0.0 (0)	0.0 (0)
Annual concentration	µg/m^3	California	12	8.5	ND	ND	—	—	—
		National	9.0	8.4	6.0	5.5	—	—	—

Sources: CARB 2024c; EPA 2024c.

1 CARB 2024c, Sonora-Barretta Street monitoring station data

2 CARB 2024c, Turlock-S Minaret Street monitoring station data

3 EPA 2024c, Modesto-14th Street monitoring station data

4 EPA 2024c, Fresno-Garland monitoring station data

5 CARB 2024c, San Andreas-Gold Strike Road monitoring station data

Notes: ppm = parts per million by volume; — = not available; µg/m^3 = micrograms per cubic meter; ND = insufficient data available to determine the value; <0.001 indicates values less than 0.0005.

Data represent the highest concentrations experienced over a given year.

Exceedances of national and California standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed national or California standards during the years shown. There is no national standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a California 24-hour standard for $PM_{2.5}$.

a Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

Attainment Designation

Table 3.2-1 (Section 3.2.1.2) presents the current attainment status of Tuolumne County with respect to the NAAQS and CAAQS. In summary, Tuolumne County is designated as a nonattainment area for the national 8-hour O_3

standard, and nonattainment-transitional for California O_3 standards. Tuolumne County is designated as unclassified or attainment for all other national and state criteria air pollutant standards.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, older adults, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air-pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air-pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005).

The Tuolumne County APCD does not have its own definition of sensitive receptors; however, there is general commonalities between definitions that generally match how the State defines sensitive receptors (e.g., facilities that house or attract children, older adults, people with illnesses, hospitals, schools, convalescent facilities, and residential areas).

The closest off-site sensitive receptor to the Tuolumne Facility is a residence located 174 feet away west of the facility.

Environmental Conditions

CalEnviroScreen, SB 535, AB 1550, and AB 617

The Tuolumne Facility is not in a disadvantaged community pursuant to SB 535 (CalEPA 2022), nor is it in a Low-Income Community pursuant to AB 1550 (CARB 2023b), or in a Community Air Protection Program pursuant to AB 617 (CARB 2023a).

The Tuolumne Facility achieves a score of 44 on the CalEnviroScreen (OEHHA 2023). The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the State.

Healthy Places

The Tuolumne Facility has an HPI score of 31.8 (Public Health Alliance of Southern California 2022). The maximum HPI score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

3.2.1.5 Port of Stockton

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, however, 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. This analysis was prepared in accordance with the San Joaquin Valley Air Pollution Control District (San Joaquin Valley APCD) Guidance for

Assessing and Mitigating Air Quality Impacts (San Joaquin Valley APCD Guidance) (San Joaquin Valley APCD 2015a). These factors are described below.

Topography

The project lies within the San Joaquin Valley Air Basin (SJVAB), which consists of eight counties and is spread across 25,000 square miles of Central California. The SJVAB is bordered on the east by the Sierra Nevada Mountains (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 and 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 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 California's Central Valley. The region's topographic features restrict air movement through and out of the SJVAB. As a result, the SJVAB is highly susceptible to pollutant accumulation over time (San Joaquin Valley APCD 2015a).

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 San Joaquin Valley often exceed 100°F.

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 in the troposphere. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. A temperature inversion can act like a lid, restricting vertical mixing of air above and below an inversion because of differences in air density and thereby trapping air pollutants below the inversion. The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in 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 (San Joaquin Valley APCD 2015a).

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 toward 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, into the Mojave Desert Air Basin. The Coastal Range and the Sierra Nevada are barriers to air movement to the west and east, respectively. A secondary but significant summer wind pattern is from the southeasterly direction and can be associated with nighttime drainage winds, prefrontal conditions, and summer monsoons. During winter, winds can be very weak, which minimizes the transport of pollutants and results in stagnation events.

Two significant diurnal wind cycles that occur frequently in 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 (San Joaquin Valley APCD 2015a).

Temperature, Sunlight, and Ozone Production

Solar radiation and temperature are particularly important in the chemistry of O_3 formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily O_3) results from atmospheric ROGs and NO_2 under the influence of sunlight. O_3 concentrations are very dependent on the amount of solar radiation, especially during late spring, summer, and early fall. O_3 levels typically peak in the afternoon. After the sun goes down, the chemical reaction between 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 (San Joaquin Valley APCD 2015a).

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 fog 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.

Urban Heat Island Effect

The “urban heat island” refers to the effect of urbanized areas on surface and air temperature compared to their rural surroundings. Buildings, roads, and other “hardscape” create an island of higher temperatures within the regional landscape. As described by the U.S. Environmental Protection Agency (EPA), “[u]rban heat islands are caused by development and the changes in radiative and thermal properties of urban infrastructure as well as the impacts buildings can have on the local microclimate—for example tall buildings can slow the rate at which cities cool off at night. Heat islands are influenced by a city’s geographic location and by local weather patterns, and their intensity changes on a daily and seasonal basis” (EPA 2008a). The term is generally used to refer to community-wide effects, particularly for large metropolitan cities. The potential adverse effects of the urban heat island effect include increased energy consumption, elevated emissions of air pollutants and greenhouse gases (GHGs), compromised human health and comfort, and impaired water quality. Increased temperatures due to the urban heat island effect may also lead to increased energy consumption, which has implications for air quality and GHG emissions. In addition to energy-related increases in air emissions, elevated air temperatures increase the rate of ground-level O_3 formation. Communities have adopted various strategies to deal with these environmental impacts, such as increasing vegetation and using more energy-efficient building materials. These strategies are often part of more general energy savings or "sustainability" practices and are not identified as "urban heat island effect" mitigation, but nevertheless they provide the benefits of reducing surface and atmospheric heat islands.

Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across the state. The San Joaquin Valley APCD monitors local ambient air quality in the vicinity of the Port of Stockton, and all the following monitoring stations are located within San Joaquin County. 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. The most recent background ambient air quality data from 2021 to 2023 are presented in Table 3.2-4. The Stockton-University Park monitoring station, located at 702 N Aurora Street, Stockton, California, is the air quality monitoring station nearest to the Port measuring O_3, NO_2, and particulate matter, located approximately 3 miles east of the Port. The Bethel Island monitoring station, located at 5551 Bethel Island Road, Bethel Island California, is the nearest monitoring station to the Port measuring SO_2, located approximately 3 miles away from the Port. The data collected at these two stations are considered to be representative of the air quality experienced in the project vicinity. The number of days exceeding the AAQS is also shown in Table 3.2-4.

Table 3.2-4. Port of Stockton Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2021	2022	2023	2021	2022	2023
Ozone (O_3)[1]									
Maximum 1-hour concentration	ppm	California	0.09	0.040	0.141	0.086	0	1	0
Maximum 8-hour concentration	ppm	California	0.070	0.037	0.114	0.069	0	1	0
		National	0.070	0.036	0.113	0.068	0	1	0
Nitrogen Dioxide (NO_2)[1]									
Maximum 1-hour concentration	ppm	California	0.18	0.034	0.044	0.045	0	0	0
		National	0.100	0.034	0.044	0.045	0	0	0
Annual concentration	ppm	California	0.030	ND	0.008	ND	—	—	--
		National	0.053	ND	0.008	0.008	—	—	—
Carbon Monoxide (CO)[2]									
Maximum 1-hour concentration	ppm	California	20	ND	ND	ND	ND	ND	ND
		National	35	1.4	2.6	2.2	0	0	0
	ppm	California	9.0	ND	ND	ND	ND	ND	ND

Table 3.2-4. Port of Stockton Local Ambient Air Quality Data

Averaging Time	Unit	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
				2021	2022	2023	2021	2022	2023
Maximum 8-hour concentration		National	9	1.0	1.7	1.4	0	0	0
Sulfur Dioxide (SO_2)[3]									
Maximum 1-hour concentration	ppm	National	0.075	0.009	0.005	0.004	0	0	0
Maximum 24-hour concentration	ppm	National	0.14	0.004	0.002	0.003	0	0	0
Annual concentration	ppm	National	0.030	0.001	0.001	0.001	—	—	—
Coarse Particulate Matter (PM_{10})[1]									
Maximum 24-hour concentration	μg/m³	California	50	72.2	81.3	81.5	ND (3)	25.3 (24)	ND (23)
		National	150	69.5	80.6	81.7	ND (0)	0.0 (0)	ND (0)
Annual concentration	μg/m³	California	20	ND	26.2	ND	—	—	
Fine Particulate Matter ($PM_{2.5}$)[1]									
Maximum 24-hour concentration	μg/m³	National	35	39.5	51.9	40.6	ND (1)	6.2 (6)	ND (6)
Annual concentration	μg/m³	California	12	ND	10.2	ND	—	—	—
		National	9.0	ND	10.1	10.6	—	—	—

Sources: CARB 2024c; EPA 2024c.

1 CARB 2024c, Stockton-University Park Street monitoring station data
2 EPA 2024c, Stockton-University Park Street monitoring station data
3 EPA 2024c, Bethel Island monitoring station data

Notes: ppm = parts per million by volume; — = not available; μg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.

Data represent the highest concentrations experienced over a given year.

Exceedances of national and California standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed national or California standards during the years shown. There is no national standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a California 24-hour standard for $PM_{2.5}$.

a Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

Attainment Designation

Table 3.2-1 (Section 3.2.1.2) presents the current attainment status of the San Joaquin Valley Air Basin with respect to the NAAQS and CAAQS. In summary, the EPA has designated the SJVAB as a nonattainment area for the national 8-hour O_3 standard, and CARB has designated the SJVAB as a nonattainment area for the California 1-hour and 8-hour O_3 standards. The SJVAB has been designated as a nonattainment area for the California 24-hour and annual PM_{10} standards, a nonattainment area for the national 24-hour and annual $PM_{2.5}$ standards, and as a nonattainment area for the California annual $PM_{2.5}$ standard. The SJVAB is designated as unclassified or attainment for all other criteria air pollutants.

Sensitive Receptors

The San Joaquin Valley APCD identifies sensitive receptors as facilities that house or attract children, older adults, people with illnesses, hospitals, schools, convalescent facilities, and residential areas (San Joaquin Valley 2015a).

The closest off-site sensitive receptor to the Port is a residence located 1,024 to the north of the Port.

Environmental Conditions

CalEnviroScreen, SB 535, AB 1550, and AB 617

The Port is located within a census tract that is designated as both a disadvantaged community pursuant to SB 535 (CalEPA 2022) and a Community Air Protection Program Community pursuant to AB 617 (CARB 2023a). It is not, however, located in a Low Income Community pursuant to AB 1550 (CARB 2023b).

Designated as a disadvantaged community, the census tract that surrounds the Port suffers from a combination of economic, health, and environmental burdens that include poverty, high unemployment, pollution, and other hazards.

The Port is also within one of 19 communities that CARB has selected to participate in the Community Air Protection Program, necessitating the community implement a Community Emissions Reduction Program (CERP) to address its air quality issues, including the burden of high cumulative exposure to pollutants.

The Port achieves a score of 54 on the CalEnviroScreen (OEHHA 2023). The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the State.

Healthy Places

The Port has an HPI score of 15.7 (Public Health Alliance of Southern California 2022). The maximum HPI score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

3.2.1.6 Existing Emissions and Effects of Wildfires

While air quality in California has generally improved in recent decades due to increased regulatory control, emissions from wildfires have trended upward and are projected to increase as climate change increases the frequency and severity of wildfires (Kinney 2008).

Wildfires produce harmful complex mixtures of criteria air pollutants and toxic air contaminants that are dependent on the type of biomass or structures burned and the conditions for burning. These criteria air pollutants can include PM, CO, NO_x, VOCs, and water vapor. Research shows a strong association between exposure to $PM_{2.5}$ from wildfire smoke and increasing severity of asthma, other respiratory diseases, such as chronic obstructive pulmonary disease (COPD), inflammation or infections, including bronchitis and pneumonia, emergency department visits, and hospital admissions. Long-term exposure to $PM_{2.5}$ is linked to a wide range of human health effects, such as respiratory and heart related illnesses and hospitalizations, adverse brain effects, depression, memory loss, learning disorders, reduced lung function growth in children, and premature death (CARB 2024d).

As shown in Table 3.2-5, annual PM emissions are correlated with acres burned from wildfire. In 2020, wildfires in California contributed approximately 1.2 million tons of $PM_{2.5}$.

Table 3.2-5. Annual PM Emissions and Acres Burned from Wildfire, 2000-2022

Year	PM_{10} (thousand tons per year)	$PM_{2.5}$ (thousand tons per year)	Acres Burned (million)*
2000	71	60	0.2
2001	91	77	0.2
2002	168	142	0.5
2003	163	138	1.0
2004	58	49	0.3
2005	25	21	0.2
2006	155	132	0.7
2007	172	146	1.0
2008	617	523	1.4
2009	92	78	0.4
2010	23	20	0.1
2011	35	29	0.2
2012	153	130	0.7
2013	176	149	0.6
2014	234	199	0.5
2015	246	208	0.8
2016	122	104	0.5
2017	398	337	1.3
2018	497	421	1.6
2019	56	48	0.3
2020	1,393	1,181	4.1
2021	1,268	1,075	2.4
2022	96	82	0.3

Source: CARB 2023c.
Notes: PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
* These acreages do not include areas where wildland vegetation data for model inputs are not available, e.g., developed areas and croplands

In addition to criteria air pollutants, TACs such as aldehydes, metals, hydrogen cyanide, and toxic VOCs can be in smoke from structural fires that contain plastics, chemically-treated wood, and other artificial materials. The concentration of pollution from wildfires is set to shave nearly a year off the life expectancy of residents in California's most polluted counties if pollution levels persist (Greenstone & Hasenkopf 2023).

3.2.2 Regulatory Setting

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. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (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 the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a State Implementation Plan that demonstrates how those areas will attain the NAAQS within mandated time frames.

Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants 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, 187 substances and chemical families were identified as HAPs.

U.S. Forest Service

The U.S. Forest Service operates as a federal agency within the United States Department of Agriculture. Its primary mission is to manage and conserve national forests and grasslands. Established in 1905, the agency has evolved over time, adapting to changing environmental, social, and economic contexts. Its regulatory authority stems from various laws, including the Weeks Act of 1911, which allowed the federal government to acquire private lands for inclusion in the National Forest System. The U.S. Forest Service exercises its power through regulations, policies, and cooperative agreements with states, tribes, and other stakeholders. Its responsibilities encompass forest management, wildfire prevention, recreation, and resource utilization, all aimed at ensuring sustainable use and protection of forested lands.

3.2.2.2 California

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 California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. As stated previously, an ambient air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harm to the public's health. For each pollutant, concentrations must be below the relevant CAAQS before a basin can attain the corresponding CAAQS. 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}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded.

California air districts (e.g., Air Pollution Control Districts [APCDs] and Air Quality Management District's [AQMDs]) have based their thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the air basin can accommodate without affecting the attainment date for the NAAQS or CAAQS. Since an ambient air quality standard is based on maximum pollutant levels in outdoor air that would not harm the public's health, and air district thresholds pertain to attainment of the ambient air quality standard, this means that the thresholds established by air districts are also protective of human health. The NAAQS and CAAQS are presented in Table 3.2-6.

Table 3.2-6. 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	9.0 μg/m³	15.0 μg/m³

Table 3.2-6. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
Lead[j,k]	30-day average	1.5 $\mu g/m^3$	—	—
	Calendar quarter	—	1.5 $\mu g/m^3$ (for certain areas)[k]	Same as primary standard
	Rolling 3-month average	—	0.15 $\mu g/m^3$	
Hydrogen sulfide	1 hour	0.03 ppm (42 $\mu g/m^3$)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 $\mu g/m^3$)	—	—
Sulfates	24 hours	25 $\mu g/m^3$	—	—
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 2024e.

Notes: O_3 = ozone; ppm = parts per million by volume; $\mu g/m^3$ = 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 $\mu g/m^3$ 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 February 7, 2024, the national annual $PM_{2.5}$ primary standard was lowered from 12 $\mu g/m^3$ to 9.0 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$.

The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ 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-$\mu g/m^3$ 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 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. 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 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. 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 both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, 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. CARB has adopted several Airborne Toxic Control Measures (ATCM) that reduce diesel emissions, including:

- Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Residential and Commercial Solid Waste Collection Vehicles (13 CCR 2020, 13 CCR 2021;
- ATCM for Diesel Particulate Matter from Portable Engines Rated 50 horsepower and greater (17 CCR 93116);
- ATCM for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities where TRUs operate (13 CCR 2477 and Article 8);
- ATCM to limit diesel-fueled commercial motor vehicle idling (13 CCR 2485);
- ATCM for In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.);
- ATCM for In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

In addition, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels.

Asbestos is strictly regulated due to its serious adverse health effects, including asbestosis and lung cancer, and based on its natural widespread occurrence and its use as a building material. CARB has established two ATCMs for naturally occurring asbestos. The first asbestos ATCM applies to Surfacing Applications (17 CCR 93106) (e.g., restricts the content of asbestos material used in surfacing applications, such as unpaved roads and parking lots), and the second asbestos ATCM is for Construction, Grading, Quarrying and Surface Mining Operations (17 CCR 93105) (i.e., requires implementation mitigation measures to minimize asbestos-laden dust during these activities).

Pursuant to the ATCM for Surfacing Applications, unless one of the exemptions detailed in the ATCM applies, no person shall use, apply, sell, supply, or offer for sale or supply any restricted material for surfacing, unless it has been tested using an approved asbestos bulk test method and determined to have an asbestos content that is less than 0.25%. As defined in this ATCM, "restricted material" means any of the following:

1. Aggregate material extracted from property where any portion of the property is located in a geographic ultramafic rock unit; and
2. Aggregate material extracted from property that is NOT located in a geographic ultramafic rock unit if the material has been:
   a. Evaluated at the request of the Air Pollution Control Officer and determined to be ultramafic rock or serpentine;
   b. Tested at the request of the Air Pollution Control Officer and determined to have an asbestos content of 0.25 percent or greater; or
   c. Determined by the owner/operator of a facility to be ultramafic rock, serpentine, or aggregate material that has an asbestos content of 0.25% or greater.
3. Any mixture of aggregate material that contains 10% or more of any of the materials listed above, or any combination thereof, shall also be considered "restricted material."

Pursuant to the ATCM for Construction, Grading, Quarrying and Surface Mining Operations, an Asbestos Dust Mitigation Plan is required for any project with greater than 1 acre of surface disturbance if any portion of the area to be disturbed is mapped as having serpentine or ultramafic rock, or if any portion of the area to be disturbed has naturally occurring asbestos as determined by the owner/operator or the Air Pollution Control Officer. The Asbestos Dust Mitigation Plan, which must include dust mitigation practices that are sufficient to ensure that no equipment or operation emits dust that is visible crossing the property line, would be required to be submitted to and approved by the local air district before any clearing, grading, or construction begins.

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that a person shall 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; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. This Section also applies to sources of objectionable odors.

Air Quality and Land Use Handbook

CARB published the Air Quality and Land Use Handbook in 2005 to provide important air quality information about certain types of facilities (e.g., freeways, refineries, distribution centers, etc.) that should be considered when siting sensitive land uses such as residences. CARB provides recommended siting distances from certain types of facilities when locating new sensitive land uses. The recommendations are advisory and should not be interpreted as defined "buffer zones. If a project is within the siting distance, CARB recommends further analysis. Where possible, CARB recommends a minimum separation between new sensitive land uses and existing sources.

Safety Training on Valley Fever Assembly Bill 203

AB 203 adds Section 6709 to the Labor Code and requires employers to provide effective Valley Fever awareness and prevention training for all construction employees at risk of prolonged exposure to dust in Fresno, Kern, Kings, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Santa Barbara, Tulare, and Ventura Counties annually and again before an employee begins work that is reasonably anticipated to cause exposure to substantial dust disturbance.

Commercial Harbor Craft Regulation

CARB adopted a Commercial Harbor Craft (CHC) Regulation in 2008 to reduce criteria air pollutant and toxic emissions from vessels like tugboats and barges. These regulations required older engines to be replaced with cleaner ones. The 2022 amendments expanded the scope to more vessel types and mandated even cleaner technologies, aiming to improve public health by reducing harmful emissions. These changes began taking effect in early 2023, with ongoing assessments of low-emission technologies by a Technical Working Group until 2032.

Mobile Cargo Handling Equipment Regulation

CARB adopted a Mobile Cargo Handling Equipment (CHE) Regulation in 2005 to reduce criteria air pollutant and toxic emissions at California's ports and intermodal railyards. The regulation was fully implemented in 2017 and targets any motorized vehicle used to handle or perform activities at these ports and yards. Currently, CARB is in the process of implementing further regulation to reduce emissions with the implementation of zero-emission technologies.

Ocean-Going Vessel Fuel Regulation

CARB approved the Ocean-Going Vessel At-Berth Regulation in 2007 to reduce emissions from container ships, passenger ships, and refrigerated-cargo ships at six California ports. CARB is also committed to develop new regulations to further reduce emissions and reduce the exposure to nearby port communities.

3.2.2.3 Local

Lassen County Air Pollution Control District

The Lassen County APCD is the local air district governing the Lassen County region. Lassen County is located in Northeastern California and is part of the Northeastern Plateau Air Basin.

Applicable Rules

- **Rule 2:0 – Permits Required.** This rule requires an Authority to Construct to be obtained and authorized by the Air Pollution Control Officer prior to any article, machine, equipment, or other contrivance being built which may cause the issuance of air contaminants. In addition, a Permit to Operate must be obtained before any article, machine, equipment, or other contrivance is operated or used.

- **Rule 4:2 – Nuisance.** This rule prohibits discharge of air contaminants or other material from any source that cause injury, detriment, nuisance, or annoyance to any considerable number of persons, or to the public, or that endanger the comfort, repose, health, or safety of any such persons, or the public, or that cause to have natural tendency to cause injury or damage to business or property.
- **Rule 4:3 – Particulate Matter.** This rule prohibits the discharge from any single combustion source whatsoever particulate matter in excess of 0.2 grains per cubic foot of gas at standard conditions, as defined in Rule 1:2u., nor from any non-combustion source whatsoever particulate matter in excess of 0.3 grain per cubic foot of gas at standard conditions, as defined in Rule 1:2u., over a period of one hour.
- **Rule 4:18 – Fugitive Dust Emissions.** This rule contains provisions to prevent particulate matter from becoming airborne.
- **Rule 4:20 – Federal New Source Performance Standards (NSPS).** This rule adopts by reference the rules, standards, criteria and requirements of Part 60, Chapter 1, Title 40, Code of Federal Regulations, which apply to all new sources of air contaminants or modifications to existing sources for identified category types subject to NSPS.
- **Rule 4:21 – National Emission Standards for Hazardous Air Pollutants (NESHAPs).** This rule adopts by reference the NESHAP provisions of Part 61, Chapter 1, Title 40, Code of Federal Regulations.
- **Rule 6:4 – Requirements.** This rule applies Best Available Control Technology (BACT) requirements to a new source under the following conditions: A new stationary source emits more than 68 kg (150 lbs.) per day of reactive organic compounds or nitrogen oxides or sulfur oxides or particulate matter; or 249 kg (550 lbs.) per day of carbon monoxide; or 1,450 g (3.2 lbs.) per day of lead, or .04 lbs/day of asbestos; or .0022 lbs/day of beryllium; or .55 lbs/day of mercury; or 5.48 lbs/day of vinyl chloride; or 16.44 lbs/day of fluorides; or 38.35 lbs/day of sulfuric acid mist; or 54.79 lbs/day of hydrogen sulfide or total reduced sulfur or sulfur compounds.
- **Rule 7:1 – Purpose and General Requirements.** Regulation 7 outlines the requirements of Title V of the federal Clean Air Act as they have been adopted by Lassen County APCD. Sources subject to Regulation 7 as outlined in Rule 7:2 shall obtain a Title V operating permit pursuant to Rule 7:1.
- **Rule 7:2 – Applicability.** Per Rule 7:2(a), the Title V permitting program under Regulation 7 is applicable to any major sources. A major source as is a stationary source that has the potential to emit a regulated air pollutant or a HAP in quantities equal or exceeding 100 tons per year of PM (PM_{10} and $PM_{2.5}$), NO_X, SO_X, VOC, or CO, or 10 tons per year of one HAP or 25 tons per year of combined HAPs.

Lassen County

Lassen County General Plan

Lassen County adopted their General Plan in 2000 (Lassen County 1999). The County's General Plan includes various goals and policies related to directly and indirectly improving air quality. Applicable goals and policies include the following:

Goal N-22. Air quality of high standards to safeguard public health, visual quality, and the reputation of Lassen County as an area of exceptional air quality.

NR74 Policy. The Board of Supervisors will continue to consider, adopt and enforce feasible air quality standards which protect the quality of the County's air quality.

NR75 Policy. The County shall consider the appropriateness and feasibility of air pollution control requirements for individual projects and may grant variances to specific requirements pursuant to established procedural guidelines.

NR76 Policy. Federal and state agencies shall be encouraged to assist the County in protecting the quality of its resources.

NR77 Policy. In the course of adopting policies pertaining to air resources in other County planning elements and are plans, the County may consider additional and more particular policies and measures to protect the quality of air resources.

Tuolumne County Air Pollution Control District

The Tuolumne County APCD is the local air district governing the Tuolumne County region. Tuolumne County is located in the southern part of the Mountain Counties Air Basin.

Applicable Rules

- **Rule 205 – Nuisance.** This rule prohibits discharge of air contaminants or other material from any source that cause injury, detriment, nuisance, or annoyance to any considerable number of persons, or to the public, or that endanger the comfort, repose, health, or safety of any such persons, or the public, or that cause to have natural tendency to cause injury or damage to business or property.
- **Rule 207 – Particulate Matter.** A person shall not release or discharge into the atmosphere from any source or single processing unit, exclusive of sources emitting combustion contaminants only, particulate matter emissions in excess of 0.1 grains per cubic foot of dry exhaust gas at standard conditions.
- **Rule 401 – Permit Required.** This rule requires any person building, altering, or replacing any source of air contaminants shall first obtain an Authority to Construct from the Air Pollution Control Officer. An Authority to Construct shall remain in effect until the Permit to Operate for that source for which the application was filed is either granted or denied or until termination pursuant to other provisions of this Regulation.
- **Rule 408 – Attainment Pollutant Air Quality Analysis.** Per Rule 408, a new facility shall use a model designated in Rule 407 to determine the increase in attainment pollutant concentrations in downwind zones and other Air Pollution Control Districts as a result of the proposed facility. Rule 408 applies only to attainment pollutants for which a facility is considered to be a major facility or major modification. As defined in Rule 102, a major facility is any facility which has the potential to emit 100 tons per year or more of a criteria pollutant or precursor.
- **Rule 411 – Emission Offset Eligibility.** This rule outlines the eligibility requirements for offsets generated and used within Tuolumne County APCD. Offset quantities must be calculated on an annual and daily basis and can be provided through the reduction of existing stationary and non-stationary sources. Offsets generated upwind in the same or adjoining Air Pollution Control District or within a 15-mile radius of the proposed project will have a required offset ratio of 1.2:1.
- **Rule 418 – Attainment Pollutant Control Technology.** Per Rule 418, any new facility subject to review under Rule 408 must apply best available control technology (BACT) to all new sources emitting an applicable attainment pollutant or precursor. BACT is defined in Rule 102 as an emission limitation, based on the maximum degree of reduction in emissions that is determined to be achievable through production processes or available control methods, systems, and techniques. BACT determinations may consider cost-effectiveness and adverse environmental impacts.

- **Rule 419 – Nonattainment Pollutant Air Quality Analysis.** This rule requires that a new facility shall use a model designated in Rule 407 to determine the increase in nonattainment pollutant concentrations in downwind zones and other Air Pollution Control Districts as a result of the proposed facility. Rule 419 applies only to nonattainment pollutants for which a facility is considered a major facility or major modification.
- **Rule 421 – Contribution to Violation of National Ambient Air Quality Standard.** Per Rule 421, any new facility subject to review under Rule 419 which is determined to contribute to concentrations exceeding the NAAQS must meet the following requirements:
  1. Each new source must meet an emission limitation that is equivalent to Lowest Achievable Emissions Rate (LAER) for the source and the applicable nonattainment pollutant or precursor.
  2. The applicant must certify that all facilities owned or operated within California are in compliance or are on approved schedules of compliance for applicable emissions limits or standard in the State Implementation Plans (SIP).
  3. Offsets shall be provided pursuant to the requirements of Rule 411.
- **Rule 424 – Authority to Construct Decision.** This rule requires the Air Pollution Control Officer to issue a preliminary decision on the approval of an Authority to Construct within one year of the application being deemed complete. For facilities with the potential to emit more than 100 tons per year of any criteria pollutant or precursor, public notice of the decision shall be posted in at least one newspaper within 10 days of the preliminary approval of the permit and shall provide a 30-day period for comments to be submitted.
- **Rule 427 – Construction or Reconstruction of Major Sources that Emit Hazardous Air Pollutants.** Rule 427 requires owners and operators of stationary sources that emit HAPs to install best available control technology for toxics (T-BACT) to any constructed or reconstructed major source of HAPs. A major source of HAPs is defined as a facility which has the potential to emit greater than 15 tons per year of a single HAP or greater than 25 tons per year of all HAPs combined.
- **Rule 429 – Federal New Source Review.** Rule 429 implements the applicable requirements of 40 CFR Part 51.165 as a result of Tuolumne County APCD's marginal nonattainment of the 2015 8-hour O_3 NAAQS. Per Rule 429-II.A.1, the preconstruction review requirements of the Rule apply to the proposed construction of any new major stationary source or major modification within the District that is major for a nonattainment pollutant. Rule 429-III incorporates the definitions of 40 CFR 51.165(a) by reference. Per 40 CFR 51.165(a)(1)(iv), for an area of marginal ozone nonattainment, the major stationary source threshold corresponds to 100 tons per year of NO_X or VOC.
- **Rule 500 – Title V Permits.** Rule 500, *Additional Procedures for issuing Permits to Operate for Sources Subject to Title V of the 1990 Federal Clean Air Act Amendments*, implements the requirements of Title V of the federal Clean Air Act and is applicable to major sources located within Tuolumne County APCD. Per Rule 500, Section II.U, a major source is defined as a stationary source which has the potential to emit a regulated air pollutant or a HAP in quantities equal to or exceeding the lesser of any of the following thresholds:
  1. 100 tons per year of any regulated air pollutant;
  2. 50 tons per year of volatile organic compounds or oxides of nitrogen for a federal nonattainment area classified as serious, 25 tons per year for an area classified as severe, or, 10 tons per year for an area classified as extreme;
  3. 70 tons per year of PM_{10} for a federal PM_{10} nonattainment area classified as serious;
  4. 10 tons per year of one HAP or 25 tons per year of two or more HAPs; or
  5. Any lesser quantity threshold promulgated by the U.S. EPA.

Tuolumne County

Tuolumne County General Plan

Tuolumne County adopted their General Plan Update in 2018 (Tuolumne County 2018). The County's General Plan includes various goals and policies related to directly and indirectly improving air quality. Applicable goals and policies include the following:

Goal 15A. Develop and sustain an air quality program that protects the public health and ambient air quality while encouraging the economic vitality of local businesses and industries.

Policy 15.A-1. Accurately determine and fairly mitigate the local and regional air quality impacts of land development projects proposed in the County.

Policy 15.A-2. Integrate land use planning, transportation planning, and air quality planning to make the most efficient use of public resources and to create a more livable environment.

Policy 15.A-3. Avoid converting land designated for industrial use to non-industrial land use designations where that change would result in land where sensitive receptors could be located in in proximity to industry, and avoid converting land to industrial use where the existing surrounding land uses support sensitive receptors, to minimize the health risks to the public resulting from criteria and toxic air pollutant emissions.

Policy 15.A-4. Reduce air emissions from project construction.

Goal 15B. Reduce traffic congestion, vehicle trips and their emissions through more efficient infrastructure, low emission technologies, and support for trip reduction programs.

Policy 15.B.1. Create a land use pattern that will encourage people to walk, bicycle or use public transit for a significant number of their daily trips.

Policy 15.B.2. Develop a modern transportation system that incorporates alternative transportation modes into the system design.

Goal 15C. Reduce criteria and toxic air pollutant emissions from wood-burning fireplaces and other wood-burning appliances.

Policy 15.C.1. Require development to reduce criteria and toxic air pollutant emissions from the use of wood burning appliances, through low emission technology, and maximize the use of energy conservation and clean or renewable energy sources.

Goal 15D. Maintain an effective open burning enforcement program that protects the public health and welfare while recognizing the need to reduce vegetative matter for the purposes of fire hazard reduction, wildland vegetation management and forest ecosystem management.

Policy 15.D.1. Work closely with federal, state and local agencies to minimize the emissions and smoke impacts from fire hazard reduction and forest management burn activities and during wildfire episodes.

Goal 18A. Reduce Greenhouse Gas (GHG) emissions from community activities and County government facilities and operations within the County to support the State's efforts under Assembly Bill 32 and other state and federal mandates to mitigate the County's GHG emissions impacts.

Policy 18.A.4. Recognize that climate change may affect air quality and water quality creating health and safety hazards.

Policy 18.A.7. Encourage reduced consumption of fossil fuel energy by promoting alternative transportation methods and encouraging pedestrian oriented development to reduce the use of motor vehicles. See the Transportation Element and the Community Development and Design Element for a detailed listing of policies and implementation programs.

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley APCD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the SJVAB. The San Joaquin Valley APCD 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 San Joaquin Valley APCD has prepared several air quality attainment plans to achieve the O_3 and PM standards, the most recent of which include the 2020 Reasonably Available Control Technology Demonstration for the 2015 8-Hour Ozone Standard (San Joaquin Valley APCD 2020); 2016 Plan for the 2008 8-Hour Ozone Standard (San Joaquin Valley APCD 2016a); 2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan (San Joaquin Valley APCD 2014); 2022 Plan for the 2015 8-Hour Ozone Standard (San Joaquin Valley APCD 2022); 2004 Revision to the California State Implementation Plan for Carbon Monoxide (San Joaquin Valley APCD 2004); 2013 Plan for the Revoked 1-Hour Ozone Standard (San Joaquin Valley APCD 2013); 2007 PM_{10} Maintenance Plan and Request for Redesignation (San Joaquin Valley APCD 2007a); 2012 $PM_{2.5}$ Plan (San Joaquin Valley APCD 2012); 2015 Plan for the 1997 $PM_{2.5}$ Standard (San Joaquin Valley APCD 2015b); 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard (San Joaquin Valley APCD 2016b); and the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards (San Joaquin Valley APCD 2018). The following sections summarize key elements of these and other recent air quality attainment plans.

Extreme 1-Hour Ozone Attainment Demonstration Plan

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

2007 8-Hour Ozone Plan

The 2007 8-Hour Ozone Plan, adopted by the Governing Board on April 30, 2007, sets forth measures and a “dual path” strategy to attain the federal 1997 8-hour O_3 standard by 2023 for the SJVAB by reducing emissions of O_3 and PM precursors (San Joaquin Valley APCD 2007b). The plan also includes provisions for improved pollution control technologies for mobile and stationary sources, as well as an increase in state and federal funding for incentive-based measures to reduce emissions. All local measures would have been adopted by the San Joaquin Valley APCD before 2012. This plan was approved by the EPA on April 30, 2012. On November 26, 2012, however, the EPA withdrew its determination that the plan satisfied the federal Clean Air Act requirements regarding emissions growth caused by growth in vehicle miles traveled. All other determinations in the EPA’s March 1, 2012, rule approving the plan remain unchanged and in effect. The San Joaquin Valley APCD is currently in the process of developing an O_3 plan to address EPA’s 2008 8-hour O_3 standard, with attainment required by 2032.

2009 Reasonably Available Control Technology State Implementation Plan

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

2013 Plan for the Revoked 1-Hour Ozone Standard

The San Joaquin Valley APCD developed a plan for EPA’s revoked 1-hour O_3 standard after the EPA withdrew its approval of the 2004 Extreme 1-Hour Ozone Attainment Demonstration Plan as a result of litigation. As a result of the litigation, the EPA reinstated previously revoked requirements for 1-hour O_3 attainment plans. The 2013 plan addresses those requirements, including a demonstration of implementation of reasonably available control measures and a demonstration of a rate of progress averaging 3% annual reductions of ROG or NO_x emissions every 3 years. The 2013 Plan for the Revoked 1-Hour Ozone Standard was approved by the Governing Board on September 19, 2013 (San Joaquin Valley APCD 2013).

2014 RACT SIP

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

San Joaquin Valley APCD 2016 Plan for the 2008 8-Hour Ozone Standard

The San Joaquin Valley APCD adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016. This plan demonstrates the practicable and expeditious attainment of the 75 parts per billion 8-hour O_3 standard (San Joaquin Valley APCD 2016a).

San Joaquin Valley APCD 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard

The San Joaquin Valley APCD adopted the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard on September 15, 2016. This plan addresses the EPA federal annual $PM_{2.5}$ standard of 12 micrograms per cubic meter (μg/m³), established in 2012. This plan includes an attainment impracticability demonstration and request for reclassification of the SJVAB from Moderate nonattainment to Serious nonattainment (San Joaquin Valley APCD 2016b).

San Joaquin Valley APCD 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards

The San Joaquin Valley APCD 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 μg/m³ and 24-hour $PM_{2.5}$ standard of 65 μg/m³, the 2006 24-hour $PM_{2.5}$ standard of 35 μg/m³, and the 2012 annual $PM_{2.5}$ standard of 12 μg/m³. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable (San Joaquin Valley APCD 2018).

2020 RACT Demonstration

The San Joaquin Valley APCD adopted the 2020 RACT Demonstration for the 2015 8-Hour Ozone Standard on June 18, 2020. 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 NOx and ROG San Joaquin Valley APCD rules to ensure that each rule meets or exceeds RACT. The 2020 RACT Demonstration fulfills Clean Air Act requirements and demonstrates that all federal RACT requirements continue to be satisfied in San Joaquin Valley (San Joaquin Valley APCD 2020).

San Joaquin Valley APCD 2022 Plan for the 2015 8-Hour Ozone Standard

The San Joaquin Valley APCD adopted the 2022 Ozone Plan on December 15, 2022. The Plan builds upon comprehensive strategies already in place from adopted District plans and CARB state-wide strategies to achieve attainment of the 70 parts per billion 8-hour O_3 standard. In addition to the District's strategies, CARB's 2022 State Strategy for the State Implementation Plan (2022 State SIP Strategy), as incorporated into the 2022 Ozone Plan, includes a number of commitments to reduce emissions from mobile sources, consumer products, pesticides, and primarily-federally and internationally regulated sources (San Joaquin Valley APCD 2022).

Particulate Matter Attainment Plans

2007 PM_{10} Maintenance Plan and Request for Redesignation

On September 20, 2007, the Governing Board approved the 2007 PM_{10} Maintenance Plan and Request for Redesignation (San Joaquin Valley APCD 2007a). After achieving compliance with the annual and 24-hour NAAQS for PM_{10} during the period from 2003 to 2006,[4] the San Joaquin Valley APCD prepared the 2007 PM_{10} Maintenance Plan and Request for Redesignation. The plan includes future emission estimates through 2020 and, based on modeling, projects that SJVAB will continue to attain the PM_{10} NAAQS through 2020. The plan does not call for adoption of new control measures. Measures called for in the 2007 8-Hour Ozone Plan and 2008 $PM_{2.5}$ Plan (discussed below) will also produce PM_{10} benefits; however, the plan does include a contingency plan if future PM_{10} levels were to exceed the NAAQS. It also includes a request that the EPA redesignate the SJVAB to attainment status for the PM_{10} NAAQS. On October 25, 2007, CARB approved the San Joaquin Valley APCD's plan with modifications to the transportation conformity budgets. On September 25, 2008, the EPA redesignated the SJVAB to attainment for the PM_{10} NAAQS and approved the PM_{10} maintenance plan.

2008 $PM_{2.5}$ Plan

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

2012 $PM_{2.5}$ Plan

Approved by the Governing Board on December 20, 2012, the 2012 $PM_{2.5}$ Plan addresses attainment of EPA's 24-hour $PM_{2.5}$ standard of 35 μg/m³ established in 2006. In addition to reducing direct emissions of $PM_{2.5}$, this plan focuses on reducing emissions of NO_x, which is a predominant pollutant in the formation of $PM_{2.5}$ in the SJVAB. The plan relies on a multilevel approach to reducing emissions through San Joaquin Valley APCD efforts (industry, the general public, employers, and small businesses) and state/federal efforts (passenger vehicles, heavy-duty trucks, and off-road sources), as well as San Joaquin Valley APCD and state/federal incentive programs to accelerate replacement of on- and off-road vehicles and equipment (San Joaquin Valley APCD 2012).

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

The Governing Board adopted the 2015 Plan for the 1997 $PM_{2.5}$ Standard on April 16, 2015 (San Joaquin Valley APCD 2015b). This plan addresses the EPA's annual $PM_{2.5}$ standard of 15 μg/m³ and 24-hour $PM_{2.5}$ standard of 65 μg/m³ established in 1997. Although nearly achieving the 1997 standards, the SJVAB experienced higher $PM_{2.5}$ levels in winter 2013–2014 due to the extreme drought, stagnation, strong inversions, and historically dry conditions; thus, the San Joaquin Valley APCD was unable to meet the attainment date of December 31, 2015. Accordingly, this plan also contains a request for a one-time extension of the attainment deadline for the 24-hour standard to 2018 and the annual standard to 2020. The plan builds on past development and implementation of effective control strategies. Consistent with EPA regulations for $PM_{2.5}$ plans to achieve the 1997 standards, the plan contains Most Stringent Measures, Best Available Control Measures, and additional enforceable commitments for further reductions in emissions, and ensures expeditious attainment of the 1997 standard.

[4] Attainment is achieved if the 3-year annual average PM_{10} concentration is less than or equal to 50 μg/m³ and the expected 24-hour exceedance days is less than or equal to 1.

2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard

On September 15, 2016, the Governing Board adopted the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard (San Joaquin Valley APCD 2016b). This plan addresses the federal mandates for areas classified as "moderate nonattainment" for the 2012 $PM_{2.5}$ NAAQS of 12 μg/m³. Consistent with EPA's $PM_{2.5}$ Implementation Rule, the plan satisfies the mandate to submit a moderate nonattainment plan to EPA by October 2016, demonstrates impracticability of attaining the 2012 $PM_{2.5}$ standard by the moderate nonattainment deadline of 2021, includes a request to reclassify San Joaquin Valley to a "serious nonattainment" area for the 2012 $PM_{2.5}$ standard, satisfies all federal Clean Air Act requirements for moderate nonattainment areas, and demonstrates that emissions are continuing to be reduced in San Joaquin Valley.

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

The San Joaquin Valley APCD 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 μg/m³ and 24-hour $PM_{2.5}$ standard of 65 μg/m³, the 2006 24-hour $PM_{2.5}$ standard of 35 μg/m³, and the 2012 annual $PM_{2.5}$ standard of 12 μg/m³. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable (San Joaquin Valley APCD 2018).

2024 Plan for the 2012 $PM_{2.5}$ Standard

The San Joaquin Valley APCD adopted the 2024 Plan for the 2012 $PM_{2.5}$ Standard on June 20, 2024, to fulfill the remaining CAA requirements, including the final modeling analysis, attainment strategy, and emission reduction commitments, reasonable further progress/quantitative milestones, and contingency measures. This Plan demonstrates expeditious attainment of the 2012 $PM_{2.5}$ standard by 2030 (San Joaquin Valley APCD 2024a).

Senate Bill 656 Particulate Matter Control Measure Implementation Schedule

Senate Bill (SB) 656 was enacted in 2003 and codified as California Health and Safety Code Section 39614. SB 656 seeks to reduce exposure to PM_{10} and $PM_{2.5}$ and to make further progress toward attainment of the NAAQS and CAAQS for PM_{10} and $PM_{2.5}$. SB 656 required CARB, in consultation with local air districts, to develop and adopt lists of "the most readily available, feasible, and cost-effective" PM control measures. Subsequently, the air districts were required to adopt implementation schedules for the relevant control measures in their districts. In June 2005, the San Joaquin Valley APCD adopted its SB 656 Particulate Matter Control Measure Implementation Schedule. The San Joaquin Valley APCD analysis of the CARB list concluded that all but one of the measures that apply to San Joaquin Valley APCD sources had been implemented or were in one of the San Joaquin Valley APCD's attainment plans for adoption within the next 2 years. The remaining measure pertains to a future amendment of a rule for gasoline transfer into stationary storage containers, delivery vessels, and bulk plants.

Applicable Rules

The San Joaquin Valley APCD'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 San Joaquin Valley APCD'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 emissions sources from land use development projects are mainly mobile sources (traffic) and area sources (small dispersed stationary and other non-mobile sources), including exempt (i.e., no permit required) sources such as consumer products, landscaping equipment, furnaces, and water heaters. Mixed-use land development projects may include nonexempt sources, including devices such as small to large boilers, stationary internal combustion engines, gas stations, and asphalt batch plants. Notwithstanding nonexempt stationary sources, which would be permitted on a case-by-case basis, the following San Joaquin Valley APCD regulations generally apply to land use development projects and are described below.

Regulation IV – Prohibitions

- **Rule 4101: Visible Emissions –** The purpose of this rule is to prohibit the emissions of visible air contaminants to the atmosphere.
- **Rule 4102: Nuisance –** Prohibits discharge of air contaminants or other materials from any source which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.
- **Rule 4201: Particulate Matter Concentration –** The purpose of this rule is to protect the ambient air quality by establishing a particulate matter emission standard.
- **Rule 4202: Particulate Matter –** Emission Rate – The purpose of this rule is to limit particulate matter emissions by establishing allowable emission rates. The calculation methods for determining the emission rate based on process weight are specified.
- **Rule 4601: Architectural Coatings –** The purpose of the rule is to limit VOC emissions from architectural coatings. This rule specifies architectural coatings storage, cleanup, and labeling requirements.
- **Rule 4641: Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations –** The purpose of this rule is to limit VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.
- **Rule 4702: Internal Combustion Engines –** The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM), and sulfur oxides (SO_x) from internal combustion engines.

Regulation VIII – Fugitive PM_{10} Prohibition

- **Rule 8021: Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities –** The purpose of this rule is to limit fugitive dust emissions from construction, demolition, excavation, extraction, and other earthmoving activities. The rule outlines Dust Control Plan requirements for certain applicable construction activities.
- **Rule 8031: Bulk Materials –** The purpose of the rule is to limit fugitive dust emissions from the outdoor handling, storage, and transport of bulk materials.
- **Rule 8041: Carryout and Trackout –** The purpose of this rule is to prevent or limit fugitive dust emissions from carryout and trackout.
- **Rule 8051: Open Areas –** The purpose of this rule is to limit fugitive dust emissions from open areas.
- **Rule 8061: Paved and Unpaved Roads –** The purpose of this rule is to limit fugitive dust emissions from paved and unpaved roads by implementing control measures and design criteria.
- **Rule 8071: Unpaved Vehicle/Equipment Traffic Areas –** The purpose of this rule is to limit fugitive dust emissions from unpaved vehicle and equipment traffic areas.

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

Regulation IX – Mobile and Indirect Sources

- **Rule 9410: Employer Based Trip Reduction –** The purpose of this rule is to reduce vehicle miles traveled (VMT) from private vehicles used by employees to commute to and from their worksites to reduce emissions of oxides of nitrogen, volatile organic compounds, and particulate matter.
- **Rule 9510: Indirect Source Review (ISR) –** The purpose of this rule is to fulfill the District's emission reduction commitments in the PM_{10} and Ozone Attainment Plans, achieve emission reductions from the construction and use of development projects through design features and on-site measures, and provide a mechanism for reducing emissions from the construction of and use of development projects through off-site measures.

Rule 9510: Indirect Source Review

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

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

San Joaquin Valley APCD Community Emissions Reduction Plans

The San Joaquin Valley APCD also administers the implementation of the AB 617 program within its jurisdictional boundaries, which includes the development of a CERP for the City of Stockton to identify cost-effective measures to achieve emission reduction targets in the community. Preparation of a CERP is done by the jurisdiction and is not prepared for individual projects. The reduction measures outlined in the City of Stockton's CERP, as approved by the San Joaquin Valley APCD in March 2021, encompasses a range of strategies to reduce community level exposure burden, including regulatory, enforcement, outreach and education, voluntary incentive-based programs, as well as partnerships with other agencies to address issues outside of the San Joaquin Valley APCD's direct regulatory authority (San Joaquin Valley APCD 2021).

City of Stockton

City of Stockton General Plan

The City of Stockton adopted their General Plan Update on December 4, 2018 (City of Stockton 2018). The County's General Plan, also called Envision Stockton 2040, includes various goals and policies related to directly and indirectly improving air quality. Applicable goals and policies include the following:

Goal SAF-4. Improve local air quality.

Policy SAF-4.1. Reduce air impacts from mobile and stationary sources of air pollution.

Policy SAF-4.2. Encourage major employers to participate in a transportation demand management program (TDM) that reduces vehicle trips through approaches such as carpooling, vanpooling, shuttles, car-sharing, bike-sharing, end-of-trip facilities like showers and bicycle parking, subscription bus service, transit subsidies, preferential parking, and telecommuting.

Policy SAF-4.3. Coordinate with the San Joaquin Valley Air Pollution Control District and non-profit organizations to promote public awareness on air quality issues and consistency in air quality impacts analyses.

Goal LU-1. Regional Destination. Become more of a regional destination that attracts destinations and invites residents to enjoy a diverse array of events and arts, entertainment, and dining options.

Policy LU-1.1. Encourage retail businesses and housing development in mixed-use developments along regional transportation routes and in areas that serve local residents.

Goal LU-2. Strong Downtown. Strengthen the Downtown to reinforce it as the region's center for government, business, finance, arts, entertainment, and dining.

Policy LU-2.5. Promote Downtown Stockton as a primary transit node that provides multi-modal connections throughout the city and region.

Goal LU-3. Authentic Neighborhoods. Protect and preserve the authentic qualities of Stockton's neighborhoods and historic districts

Policy LU-3.2. Retain narrower roadways and reallocate right-of-way space to preserve street trees and mature landscaping and enhance the pedestrian and bicycle network within and adjacent to residential neighborhoods.

Goal LU-5. Protected Resources. Protect, maintain, and restore natural and cultural resources.

Policy LU-5.3. Define discrete and clear city edges that preserve agriculture, open space, and scenic views.

Goal LU-6. Effective Planning. Provide for orderly, well-planned, and balanced development.

Policy LU-6.2. Prioritize development and redevelopment of vacant, underutilized, and blighted infill areas.

Policy LU-6.4. Ensure that land use decisions balance travel origins and destinations as in close proximity as possible, and reduce vehicle miles traveled (VMT).

Port of Stockton

Port of Stockton Clean Air Plan

The Port of Stockton adopted a Clean Air Plan in April 2023 (Port of Stockton 2023a). The Port of Stockton Clean Air Plan defines strategies for reducing air emissions in the near term while charting a long-term path for the Port to reach zero emissions. It focuses on the five main sources of Port-related emissions: heavy-duty trucks, cargo-handling equipment, harbor craft, ships, and locomotives, among other strategies. The strategies set forth in the Port of Stockton Clean Air Plan to reduce air- and climate-related community impacts are identified below.

Heavy-Duty Trucks

TRUCKS-1. Identify ways to route trucks away from the community and work with city and regional partners to implement the actions.

TRUCKS-2. Identify opportunities to pave unpaved lots and roads to reduce fugitive dust emissions from trucks.

TRUCKS-3. Collaborate with other agencies on a regional anti-idling plan and increased enforcement of idling limits at distribution centers, warehouses or other facilities within the Port.

TRUCKS-4. Identify ways to enhance goods movement efficiency and improve traffic flow, particularly around neighborhoods impacted by trucks.

TRUCKS-5. Assist truck operators in securing grant funds for zero-emission trucks and infrastructure.

TRUCKS-6. Develop the Port of Stockton Electric Vehicle Blueprint to identify the actions needed to support a zero-emissions truck transition.

TRUCKS-7. In partnership with tenants, facilitate the development and implementation of Zero-Emissions Truck Transition Plans at each facility to accelerate the introduction of zero-emission trucks.

Cargo-Handling Equipment

EQUIP-1. Develop the Port of Stockton Electric Vehicle Blueprint to identify the actions needed to support a zero-emissions equipment transition.

EQUIP-2. Seek grants to buy zero-emissions equipment and help terminal operators secure grants.

EQUIP-3. In partnership with tenants, facilitate the development and implementation of Zero-Emissions Terminal Transition Plans at each facility to accelerate the introduction of zero-emissions equipment.

EQUIP-4. Transition all Port-owned equipment to zero emissions by 2030 or in advance of the State regulation, whichever is earlier, when feasible.

EQUIP-5. Set a goal to transition tenant-owned equipment to zero emissions by 2035 or in advance of the State regulation, when feasible.

EQUIP-6. Evaluate the use of renewable diesel in cargo-handling equipment.

Harbor Craft

TUGS-1. Provide assistance for harbor craft operators in securing grant funds to transition to cleaner tugboats and to fund zero-emission tugboat demonstrations.

TUGS-2. Require harbor craft operators to have shore power infrastructure at their berths and to use this infrastructure to eliminate at-berth idling emissions.

TUGS-3. Establish slow-speed zones near homes and community facilities to reduce noise and emissions around population centers.

TUGS-4. Evaluate ways to phase out the oldest harbor craft engines (Tier 0 and potentially Tier 1) through incentives or tariff requirements.

Ships

SHIPS-1. Conduct technology demonstrations for barge- or land-based systems that eliminate at-berth emissions.

SHIPS-2. Develop an incentive program to encourage the deployment of the cleanest ships to Stockton.

Rail

RAIL-1. Secure grants to help rail operators transition to the cleanest available locomotives and to demonstrate advanced zero-emission technologies.

RAIL-2. Evaluate the possibility of contractual conditions to require Central California Traction Company, the short-line rail operator, to deploy cleaner locomotives in advance of the State's locomotive regulation.

Other Strategies

FLEET-1. Transition the Port's fleet of on-road vehicles to zero emissions by 2035.

FLEET-2. Develop the Port of Stockton Electric Vehicle Blueprint to identify the actions needed to support a zero-emissions on-road fleet transition.

BARRIERS-1. Evaluate potential locations for vegetative barriers and work with the community and regional partners to install such barriers, particularly around facilities and along truck routes in close proximity to residents, schools, and other neighborhood uses.

TREES-1. Expand the Port's urban greening program through more tree plantings, particularly in parts of the community that are highly impacted by trucks and Port-related uses.

3.2.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to air quality are based on Appendix G of the CEQA Guidelines. According to Appendix G of the CEQA Guidelines, a significant impact related to air quality would occur if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan?
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?
- Expose sensitive receptors to substantial pollutant concentrations?
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Appendix G 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 project would have a significant impact on air quality.

Most California air districts recommend mass emission thresholds (e.g., pounds per day, tons per year) to determine whether a project's emissions of criteria air pollutant would be significant under CEQA and would result in a cumulatively considerable net increase of any criteria pollutant. As detailed below, the project includes multiple components and associated activities could occur in various air districts throughout the state.

Sustainable Forest Management Projects and feedstock sources may occur within the Working Area of each pellet facility. For the Lassen Facility, feedstock activity may occur within the following air districts:

- Butte County AQMD
- Lassen County APCD
- Modoc County APCD
- North Coast Unified AQMD
- Northern Sierra AQMD
- Shasta County AQMD
- Siskiyou County APCD
- Tehama County APCD

For the Tuolumne Facility, feedstock activity may occur within the following air districts:

- Amador County APCD
- Calaveras County APCD
- El Dorado APCD
- Feather River AQMD
- Great Basin Unified APCD
- Mariposa County APCD
- Northern Sierra AQMD
- Placer County APCD

- Sacramento Metropolitan AQMD
- San Joaquin Valley APCD
- Tuolumne County APCD

The thresholds for each of the above-referenced air districts are summarized in the Table 3.2-7 below. The phasing out of leaded gasoline started in 1976. As gasoline no longer contains lead, the project is not anticipated to result in impacts related to lead; therefore, it is not discussed in this analysis or included in Table 3.2-7.

The Lassen Facility is located within the Lassen County APCD jurisdiction and would be subject to Lassen County APCD rules, regulations, and guidance. Lassen County APCD does not have established CEQA thresholds. Therefore, this analysis utilizes the Lassen County APCD Rule 6:4 Best Available Control Technology (BACT) Requirements.

The Tuolumne Facility is located within the Tuolumne County APCD jurisdiction and would be subject to Tuolumne County APCD rules, regulations, and guidance, including Tuolumne County APCD CEQA thresholds.

Transport of the wood pellets from the pellet facilities to the Port of Stockton would travel through multiple air districts along the BNSF railway. From Lassen to the Port of Stockton, the trains would travel through the following air districts:

- Lassen County APCD
- Northern Sierra AQMD
- Butte County APCD
- Feather River AQMD
- Sacramento Metro AQMD
- San Joaquin Valley APCD

Transport of wood pellets by train from the Tuolumne Facility to Port of Stockton would pass through two air districts: Tuolumne County APCD and San Joaquin Valley APCD.

The Port of Stockton is located within the San Joaquin Valley APCD jurisdiction and would be subject to San Joaquin Valley APCD rules, regulations, and guidance, including San Joaquin Valley APCD CEQA thresholds presented in their Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI).

Transport of the wood pellets by ship would travel through the San Joaquin Valley APCD jurisdiction and Bay Area AQMD jurisdiction.

The evaluation of whether the project would conflict with or obstruct implementation of the applicable air quality plan (CEQA Guidelines, Appendix G, Threshold 1) is based on (1) consistency with the underlying land use designations (e.g., General Plan designation), and (2) potential to exceed numeric thresholds established to determine if a project would result in a significant air quality impact. While each air district may have specific guidance on how to address Threshold 1, the above-referenced two approaches are the most commonly applied considerations in determining the potential for a project to conflict with an applicable air quality plan established by an air district. As such, these two criteria are applied to evaluate the project's potential impact under Threshold AQ-1.

To evaluate the potential for the project to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (CEQA Guidelines, Appendix G, Threshold 2), this analysis applies the appropriate air district's construction and operational criteria pollutants mass thresholds (daily and/or annual), as shown in Table 3.2-7.

Consistent with the San Joaquin Valley APCD GAMAQI, as well as other air district guidance, a project is considered to result in a cumulatively considerable net increase in O_3 if the project's construction or operational emissions would exceed the relevant air district VOC/ROG or NO_x thresholds shown in Table 3.2-7. These emissions-based thresholds for O_3 precursors are intended to serve as a surrogate for an "ozone significance threshold" (i.e., the potential for adverse O_3 impacts to occur). This approach is used because O_3 is not emitted directly, and the effects of an individual project's emissions of O_3 precursors (VOC and NO_x) on O_3 levels in ambient air cannot be determined reliably or meaningfully through air quality models or other quantitative methods. Thus, if an area is nonattainment for O_3, exceedance of the applicable VOC/ROG or NO_x thresholds will result in a significant impact under CEQA Guidelines, Appendix G, Threshold 2 relating to O_3.

The Lassen County APCD and Tuolumne County APCD do not have guidance on preparing an ambient air quality analysis (AAQA). Therefore, the San Joaquin Valley APCD GAMAQI was relied upon for this purpose in all three jurisdictions, and a 100 pound per day screening threshold was applied for onsite emissions. If the screening threshold was exceeded, an AAQA was prepared in accordance with San Joaquin Valley APCD APR 1925, *Policy for District Rule 2201 AAQA Modeling* (San Joaquin Valley APCD 2024b).

The assessment of the project's potential to expose sensitive receptors to substantial pollutant concentrations (CEQA Guidelines, Appendix G, Threshold 3) includes a qualitative CO hotspot analysis and a quantitative health risk assessment. The cancer risk threshold applied for Lassen County APCD and Tuolumne County APCD is 10 in 1 million and non-cancer hazard index (chronic and acute) of 1. The cancer risk threshold for San Joaquin Valley APCD is 20 in 1 million and non-cancer hazard index (chronic and acute) of 1.

The potential for the project to result in other emissions, specifically an odor impact (CEQA Guidelines, Appendix G, Threshold 4), is based on the project's anticipated construction and operational activity, land use types, and the potential for the project to create an odor nuisance pursuant to air district nuisance rules.

Table 3.2-7. Criteria Air Pollutant Thresholds of Significance by California Air District

Air District	VOC (ROG)		NOX		PM_{10}		$PM_{2.5}$		SOX		CO	
	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Amador County APCD	No thresholds											
Bay Area AQMD (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Southern Sonoma, and Southwest Solano County)	54 lb/day	54 lb/day 10 tpy	54 lb/day	54 lb/day or 10 tpy	82 lb/day (exhaust) BMPs for fugitive dust	82 lb/day or 15 tpy None for fugitive dust	54 lb/day (exhaust) BMPs for fugitive dust	54 lb/day or 10 tpy None for fugitive dust	No threshold		No threshold	9.0 ppm (8- hour average, 20.0 ppm (1-hour average)
Butte County AQMD	137 lb/day or 4.5 tpy	25 lb/day	137 lb/day or 4.5 tpy	25 lb/day	80 lb/day	80 lb/day	80 lb/day	80 lb/day	No threshold			
Calaveras County ACPD	150 lb/day	150 lb/day	150 lb/day	150 lb/day	150 lb/day	150 lb/day	No thresholds					
El Dorado County AQMD	82 lb/day		82 lb/day		No thresholds							
Feather River AQMD (Sutter and Yuba County)	25 lb/day multiplied by project length; not to exceed 4.5 tpy	25 lb/day	25 lb/day multiplied by project length; not to exceed 4.5 tpy	25 lb/day	80 lb/day		No thresholds					
Great Basin Unified APCD (Inyo, Mono, and Alpine County)	No thresholds											
Lassen County APCD[a]	150 lb/day		150 lb/day		150 lb/day		150 lb/day		150 lb/day		550 lb/day	
Mariposa County APCD	100 tpy		100 tpy		100 tpy		100 tpy		100 tpy		100 tpy	
Modoc County APCD	No thresholds											
North Coast Unified AQMD (Del Norte, Humboldt, and Trinity County)	No thresholds											
Northern Sierra AQMD[b] (Nevada, Sierra, and Plumas County)	<24 lb/day (Level A) 24-136 lb/day (Level B) >136 lb/day (Level C)		<24 lb/day (Level A) 24-136 lb/day (Level B) >136 lb/day (Level C)		<79 lb/day (Level A) 79-136 lb/day (Level B) >136 lb/day (Level C)		No thresholds					
Placer County APCD	82 lb/day	55 lb/day	82 lb/day	55 lb/day	82 lb/day	82 lb/day	No thresholds					
Sacramento Metropolitan AQMD	No threshold	65 lb/day	85 lb/day	65 lb/day	80 lb/day or 14.6 tpy (following application of all feasible BMPs)	80 lb/day or 14.6 tpy (following application of all feasible BMPs)	82 lb/day or 15 tpy (following application of all feasible BMPs)	82 lb/day or 15 tpy (following application of all feasible BMPs)	Concentrations below CAAQS for SOx		Concentrations below CAAQS for CO	
San Joaquin Valley APCD (San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Western Kern County)	10 tpy	10 tpy	10 tpy	10 tpy	15 tpy	15 tpy	15 tpy	15 tpy	27 tpy	27 tpy	100 tpy	100 tpy
Shasta County AQMD[b]	25 lb/day (Level A) or 137 lb/day (Level B)		25 lb/day (Level A) or 137 lb/day (Level B)		80 lb/day (Level A) or 137 lb/day (Level B)		No thresholds					
Siskiyou County APCD	No thresholds											
Tehama County APCD[b]	≤25 lb/day (Level A/MND or ND) >25 lb/day (Level B/MND or EIR) >137 lb/day (Level C/EIR)		≤25 lb/day (Level A/MND or ND)		≤80 lb/day (Level A/MND or ND) >80 lb/day (Level B/MND		No thresholds					

Table 3.2-7. Criteria Air Pollutant Thresholds of Significance by California Air District

Air District	VOC (ROG)		NOX		PM_{10}		$PM_{2.5}$		SOX		CO	
	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
			>25 lb/day (Level B/MND or EIR) >137 lb/day (Level C/EIR)		or EIR) >137 lb/day (Level C/EIR)							
Tuolumne County APCD	1,000 lb/day or 100 tpy		1,000 lb/day or 100 tpy		1,000 lb/day or 100 tpy		No thresholds				1,000 lb/day or 100 tpy	

Source: Bay Area AQMD 2017, Butte County AQMD 2024, Calaveras County 2018, El Dorado APCD 2002, Feather River AQMD 2010, Mendocino County AQMD 2013, Mariposa County2006], Northern Sierra AQMD 2009, Placer County APCD 2016, San Joaquin Valley APCD 2015c, Sacramento Metropolitan AQMD 2015, Tehama County APCD 2015, Tuolumne County APCD [No Date].
Notes: APCD = Air Pollution Control District; AQMD; Air Quality Management District; lb/day = pound per day; tpy = tons per year; ppm = parts per million.
[a] Lassen County APCD does not have established CEQA thresholds. However, this analysis applies the Lassen County APCD Rule 6:4 Best Available Control Technology (BACT) Requirements.
[b] For Northern Sierra AQMD, Shasta County AQMD, and Tehama County APCD, the highest thresholds are applied herein, as this CEQA document is an EIR.

3.2.4 Impact Analysis

3.2.4.1 Methodology

The project would consist of three primary phases: feedstock acquisition, wood pellet production, and transport to market. The impact analysis herein evaluates each of these primary phases as related to air quality with the methodology and assumptions summarized below. Details are provided in Appendices B1 through B4. As discussed in Chapter 1, this EIR analyzes the wood pellet production and transport to market phases of the project at the project-level, whereas the feedstock acquisition phase is evaluated at the program-level.

3.2.4.1.1 Feedstock Acquisition

The project would implement project design features (PDFs) as best practices that would also reduce criteria air pollutant emissions and other potential environmental impacts during feedstock acquisition, thereby achieving air quality co-benefits. As set forth in Chapter 2, PDFs will be incorporated as enforceable contract terms in the public-private partnership agreement between GSFA and GSNR through which GSNR is authorized to perform project activities. The project would implement PDF-AQ-1, PDF-AQ-2, and PDF-AQ-3, as follows:

PDF-AQ-1 Air District Regulatory Compliance – Feedstock Acquisition. All treatment activities will comply with the applicable air quality requirements of air districts within whose jurisdiction the project is located.

PDF-AQ-1 is not quantified in the analysis.

PDF-AQ-2 Fugitive Dust Control – Feedstock Acquisition. To minimize dust during treatment activities, the following measures will be implemented:

- Limit the speed of vehicles and equipment traveling on unpaved areas to 15 miles per hour to reduce fugitive dust emissions.
- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved roads) will be maintained using water or another CARB-approved non-toxic dust control agent as necessary to avoid particulate emissions that may “cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property,” per Health and Safety Code Section 41700.
- Remove visible dust, silt, or mud tracked-out on to public paved roadways where sufficient water supplies and access to water is available.
- Suspend ground-disturbing treatment activities, including land clearing and bulldozer lines, when there is visible dust transport (particulate pollution) outside the treatment boundary, if the particulate emissions may “cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property,” per Health and Safety Code Section 41700.

PDF-AQ-2 is quantified in the construction analysis within CalEEMod where "limit vehicle speeds on unpaved roads" was selected. Due to the variability of conditions and the potential infeasibility to water on public roads and certain private roads, the modeling did not account for watering, nor did it take credit for the corresponding reduction in fugitive dust emissions.

PDF-AQ-3 Naturally Occurring Asbestos Best Practices – Feedstock Acquisition. Ground-disturbing treatment activities will be avoided in areas identified as likely to contain naturally occurring asbestos (NOA) per maps and guidance published by the California Geological Survey, unless an Asbestos Dust Control Plan (17 CCR Section 93105) is prepared and approved by the air district(s) with jurisdiction over the treatment area. Any NOA-related guidance provided by the applicable air district will be followed.

PDF-AQ-3 is not quantified in the analysis.

Sustainable Forest Management Projects (Program-Level)

Operational activities associated with the acquisition of feedstock primarily involve use of offroad equipment to remove feedstock and transport of feedstock from the forest to the pellet facilities via truck. As such, Sustainable Forest Management Projects were modeled as construction activities[5] using California Emissions Estimator Model (CalEEMod) Version 2022.1.1.25. Construction scenario assumptions, including phasing, equipment mix, and vehicle trips, were based on information provided by the project applicant and CalEEMod default values when project specifics have not yet been determined. Because activity would occur within multiple air districts, emission factors representing the Statewide vehicle mix and emissions for 2025[6] were used to estimate emissions associated with vehicular sources.

Some feedstock acquisition activities would occur as a direct result of the project; other activities are currently occurring and would continue in the absence of the project. The feedstock activities, modeled as concurrent construction phases in CalEEMod, include Harvest Residuals, GSNR Biomass Only Thinning Projects, and Mill Residuals.

Daily activities would generally use the same equipment and vehicles; as such, an average construction day scenario was identified. An average day would have multiple crews operating in different air districts on a given day. However, for purposes of comparing emissions to the most stringent daily or annual threshold, it was conservatively assumed that all crews would be operating in the same air district 100% of the time, which is unlikely in practice. (More precise specification of the percentage of crews operating in any given air district at any given time is impracticable at the program-level, as individual Sustainable Forest Management Project locations and timing have not yet been determined.)

5 The construction module in CalEEMod calculates short-term construction emissions associated with the following sources: exhaust emissions from off-road equipment and on-road mobile vehicles, fugitive dust emissions, and evaporative VOC emissions. The construction module is more representative of sustainable forest management projects.

6 The analysis assumes an operational year of 2025, which represents the earliest year feedstock operations could initiate. Assuming the earliest start date for operation represents the worst-case scenario for criteria air pollutant emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

Lassen Feedstock Area

Table 3.2-8 presents the construction scenario assumptions in CalEEMod used for estimating emissions associated with the acquisition of feedstock in the Lassen feedstock area. The total average daily equipment load, worker trips, vendor (i.e. water) truck trips, and haul truck trips have been developed based on available information provided by the project applicant.

Implementation of Sustainable Forest Management Projects would result in 547 average daily one-way trips as a result of logging/haul trucks in the Lassen Feedstock area (See Chapter 3.14, Transportation). For emissions modeling, the trips were rounded up to an even 548 average daily one-way trips. According to the *Road Surface Haul Analysis* provided by Westside Geographic Analysis, the haul truck trip distances were assumed to be 109 miles roundtrip, or 54.5 miles one-way. On average, 11.3 of those miles would be on unpaved roads and 97.7 miles would be on paved roads (Road Surface Haul Analysis 2023*;* Appendix B2). Therefore, in CalEEMod, it was assumed that haul trucks traveled an average of 48.85 miles on paved roads and 5.65 miles on unpaved roads per one-way trip.

As described in PDF-AQ-2, watering of unpaved roads would be done as necessary and feasible. However, due to the variability of conditions and the potential infeasibility to water on public roads and certain private roads, the modeling did not account for watering on unpaved roads, nor did it take credit for the corresponding reduction in fugitive dust emissions. Regardless, in a good faith effort, the emissions from the use of vendor (i.e. water) trucks were conservatively included in the calculations in the chance that they are used. Unpaved roads in the Lassen feedstock area are anticipated to require watering one to two times per day in order to effectively reduce the dust produced by logging/haul trucks. A common application rate cited for road watering is approximately 2,000 gallons per mile of road (Midwest Industrial Supply 2016). A water truck designed for on-road use typically accommodates up to 6,000 gallons of water per truck (BigRentz 2023). Assuming this water truck capacity and watering rate, the number of full-time operation crews, the average miles on unpaved roads, the project would require approximately 125 total vendor trucks per day, equating to 250 average daily one-way trips.[7] Vendor trucks were assumed to travel the haul length of 54.5 miles per one-way trip.

The average daily worker trips were calculated based on the number of full-time operation crews needed in the Lassen feedstock area. There would be 33 full-time operation crews, and it was conservatively assumed that there would be 6 workers in each crew, resulting in approximately 200 average daily workers, or 400 average daily worker one-way trips. The worker trip distance was assumed to be 35.42 miles, which is the estimated one-way trip length per employee from the OnTheMap application in the Lassen County VMT per Employee Summary as described in Chapter 3.14, Transportation.

7 As shown in the Road Surface Haul Analysis (Appendix B2) the average miles on unpaved roads would be 11.3 miles roundtrip. Assuming 11.3 miles of unpaved road per operation, 33 full-time operations crews, and a watering rate of 2,000 gallons per mile, water consumption for road watering is estimated to be approximately 745,800 gallons per day. Assuming a water truck capacity of 6,000 gallons, the project would require approximately 125 vendor trucks per day, or 250 average daily one-way vendor truck trips.

Table 3.2-8. Lassen Feedstock Acquisition Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Daily Usage Hours
Harvest Residuals	188	120	264	Loaders (Heel Booms)[1]	16	10
				Chippers[2]	5	8
GSNR Biomass Only Thinning Projects	212	126	274	Rubber Tired Skidders[3]	36	10
				Loaders (Heel Booms)[1]	18	10
				Feller Bunchers[4]	36	10
				Chippers[2]	18	8
Mill Residuals[5]	0	4	10	N/A	N/A	N/A

Notes: See Appendix B1 for additional details; Vendor trucks represent water trucks; N/A = not applicable.
1 Loaders (Heel Booms) modeled as Tractors/Loaders/Backhoes in CalEEMod at 207 hp.
2 Chippers modeled as Other Construction Equipment in CalEEMod at 998 hp.
3 Rubber Tired Skidders modeled as Rubber Tired Dozers in CalEEMod at 219 hp.
4 Feller Bunchers modeled as Other Construction Equipment in CalEEMod at 286 hp.
5 "Mill Residuals" are residual biomass materials, including residual chips, sawdust, planer shavings, bark and other byproducts, of commercial lumbermills operated by third-parties unaffiliated with GSNR. Therefore, no GSNR workers or equipment are involved in this phase. The feedstock is transported by truck from the mill to the wood pellet processing facility.

Tuolumne Feedstock Area

Table 3.2-9 presents the construction scenario assumptions in CalEEMod used for estimating emissions associated with the acquisition of feedstock in the Tuolumne feedstock area. The equipment load, vendor truck trips, and haul truck trips have been developed based on available information provided by the project applicant.

Implementation of Sustainable Forest Management Projects would result in 236 average daily trips as a result of logging/haul trucks in the Tuolumne Feedstock area (See Chapter 3.14, Transportation). According to the *Road Surface Haul Analysis* provided by Westside Geographic Analysis, the haul truck trip distances were assumed to be 111.4 miles roundtrip, or 55.7 miles one-way. On average, 6.6 of those miles would be on unpaved roads and 104.8 miles would be on paved roads (Road Surface Haul Analysis 2024, Appendix B2). Therefore, in CalEEMod, it was assumed that haul trucks traveled an average of 52.4 miles on paved roads and 3.3 miles on unpaved roads per one-way trip.

As described above and in PDF-AQ-2, watering of unpaved roads would be done as feasible. The same watering methodology discussed above for the Lassen feedstock area was applied herein as well. Assuming the same water truck capacity and watering rate, the number of full-time operation crews, the average miles on unpaved roads, the project would require approximately 30 total vendor trucks per day, equating to 60 average daily one-way trips.[8] Vendor trucks were assumed to travel 55.7 miles per one-way trip.

8 As shown in the Road Surface Haul Analysis (Appendix B2) the average miles on unpaved roads would be 6.6 miles roundtrip. Assuming 6.6 miles of unpaved road per operation, 13 full-time operations crews, and a watering rate of 2,000 gallons per mile, water consumption for road watering is estimated to be approximately 171,600 gallons per day. Assuming a water truck capacity of 6,000 gallons, the project would require approximately 30 vendor trucks per day, or 60 average daily one-way vendor truck trips.

The average daily worker trips were calculated based on the number of full-time operation crews needed in the Tuolumne feedstock area. There would be 13 full-time operation crews, and it was conservatively assumed that there would be 6 workers in each crew, resulting in approximately 78 average daily workers, or 166 average daily worker one-way trips. The worker trip distance was assumed to be 50.2 miles, which is the estimated one-way trip length per employee from the Tuolumne County VMT Summary as described in Chapter 3.14, Transportation.

Table 3.2-9. Tuolumne Feedstock Equipment Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Daily Usage Hours
Harvest Residuals	116	40	158	Loaders (Heel Booms)[1]	10	10
				Chippers[2]	3	10
GSNR Biomass Only Thinning Projects	50	18	72	Rubber Tired Skidders[3]	9	8
				Loaders (Heel Booms)[1]	5	10
				Feller Bunchers[4]	9	10
				Chippers[2]	5	10
Mill Residuals[5]	0	2	6	N/A	N/A	N/A

Notes: See Appendix B1 for additional details.

1 Loaders (Heel Booms) modeled as Tractors/Loaders/Backhoes in CalEEMod at 207 hp.

2 Chippers modeled as Other Construction Equipment in CalEEMod at 998 hp.

3 Rubber Tired Skidders modeled as Rubber Tired Dozers in CalEEMod at 219 hp.

4 Feller Bunchers modeled as Other Construction Equipment in CalEEMod at 286 hp.

5 "Mill Residuals" are residual biomass materials, including residual chips, sawdust, planer shavings, bark and other byproducts, of commercial lumbermills operated by third-parties unaffiliated with GSNR. Therefore, no GSNR workers or equipment are involved in this phase. The feedstock is transported by truck from the mill to the wood pellet processing facility.

3.2.4.1.2 Wood Pellet Production (Project-Level)

The project would implement site design features (SDFs) as best practices that would also reduce criteria air pollutant emissions and other potential environmental impacts at the Lassen Facility, Tuolumne Facility, and Port of Stockton, thereby achieving air quality co-benefits. As set forth in Chapter 2, SDFs will be incorporated as enforceable contract terms in the public-private partnership agreement between GSFA and GSNR through which GSNR is authorized to perform project activities. The project would implement SDF-AQ-1, SDF-AQ-2, and SDF-AQ-3, as follows:

SDF-AQ-1 Air District Regulatory Compliance – Lassen Facility, Tuolumne Facility, and Port of Stockton. All construction and operation activities will comply with the applicable air quality requirements of air districts within whose jurisdiction the project is located.

SDF-AQ-1 is not quantified in the analysis.

SDF-AQ-2 Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton. Prior to the issuance of grading permits, the GSNR or its designee shall develop and implement separate dust control plans to reduce project-generated construction dust at the Lassen

Facility, Tuolumne Facility, and Port of Stockton and comply with applicable Air District rules and regulations. The plan shall include the following:

- The name(s), address(es), and phone number(s) of person(s) responsible for the preparation, submission, and implementation of the plan;
- A description and location of all construction activities;
- A comprehensive list of all fugitive dust emissions sources related to facility construction;
- Identification of a Dust Control Supervisor for the project that meets the following requirements:
  - Is on-site or is available to be on-site after initial contact;
  - Has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all applicable Air District rules and regulations

At a minimum, the dust control plan shall include the following control strategies:

A. Water or another Air District-approved non-toxic dust control agent shall be used on the exposed areas at least three times daily.
B. Water or another Air District-approved non-toxic dust control agent shall be used on the unpaved surfaces at least two times daily.
C. Water or another Air District-approved non-toxic dust control agent shall be used on the demolished areas at least two times daily.
D. A 15-mph speed limit on unpaved surfaces shall be enforced.
E. All main roadways shall be constructed and paved as early as possible in the construction process.
F. Building pads shall be finalized as soon as possible following site preparation and grading activities.
G. Grading areas shall be stabilized as quickly as possible.
H. Chemical stabilizer shall be applied, a gravel pad shall be installed, or the last 100 feet of internal travel path within the construction site shall be paved prior to public road entry, as well as for all haul roads.
I. Wheel washers shall be installed adjacent to the apron for tire inspection and washing prior to vehicle entry on public roads.
J. Visible track-out into traveled public streets shall be removed with the use of sweepers, water trucks, or a similar method.
K. Sufficient perimeter erosion control shall be provided to prevent washout of silty material onto public roads.
L. Unpaved construction site egress points shall be graveled to prevent track-out.
M. Construction access points shall be wet-washed at the end of the workday if any vehicle travel on unpaved surfaces has occurred.
N. Transported material in haul trucks shall be watered or treated.

O. Open storage piles (i.e., any accumulation of bulk material) shall be watered on a daily basis when there is evidence of wind driven fugitive dust (i.e. winds exceeding 25 mph) or shall be covered with temporary coverings.

P. All haul trucks shall use tarps or other suitable enclosures when transporting bulk materials to/from/throughout the project site. Material shall be stabilized while loading and maintain at least six inches of freeboard on haul vehicles. Transported material in haul trucks shall be watered or treated. Haul trucks shall be washed prior to leaving the site to remove soil deposits and minimize track-out.

Q. Haul truck staging areas shall be provided for loading and unloading of soil and materials and shall be located away from sensitive receptors at the farthest feasible distance.

R. Construction traffic control plans shall route delivery and haul trucks required during construction away from sensitive receptor locations and congested intersections to the extent feasible. Construction traffic control plans shall be finalized and approved prior to issuance of grading permits.

S. The Dust Control Supervisor for the project shall prepare monthly compliance reports to be submitted for review by Golden State Finance Authority that demonstrate compliance with the Fugitive Dust Control Plan and associated measures.

SDF-AQ-2 is quantified in the construction analysis within CalEEMod where “water three times per day,” “water demolished area,” “water unpaved construction roads,” and “limit vehicle speeds on unpaved roads” were selected.

SDF-AQ-3 Operational Odor Control – Lassen Facility and Tuolumne Facility. To address potential odors from the project at the Lassen Facility and Tuolumne Facility, the project shall implement an Odor Abatement Plan (OAP) as both facility sites. The OAP shall include the following:

A. Name and telephone number of contact person(s) at the facility responsible for logging in and responding to odor complaints

B. Policy and procedure describing the actions to be taken when an odor complaint is received, including the training provided to the staff on how to respond

C. Description of potential odor sources at the facility

D. Description of potential methods for reducing identified potential odor sources

E. Contingency measures to curtail emissions in the event of a public nuisance complaint.

SDF-AQ-3 is not quantified in the analysis.

Lassen Facility

Construction Mass Emissions

For purposes of estimating project emissions, and based on information provided by the project applicant, it is assumed that construction of the Lassen Facility would commence in October 2024 and would last approximately 15 months, ending in December 2025.[9] Table 3.2-10 presents the construction scenario assumptions used for estimating construction emissions of the Lassen Facility in CalEEMod. The construction schedule and equipment load has been developed based on available information provided by the project applicant, typical construction practices, and CalEEMod default assumptions.

Construction of the Lassen Facility would generate criteria air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, and asphalt pavement application. No demolition is required for the project as there are no structures on the Lassen Facility. An estimated 5,220 cubic yards of soils would be imported during the grading phase, resulting in 6 one-way haul truck trips per day. Vendor and haul trucks during the site preparation, grading, and rail spurs construction phases were also modeled as on-site trucks in CalEEMod and were assumed to travel on-site for approximately 0.25 miles. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Construction of project components would be subject to Lassen County APCD Rule 4.18, Fugitive Dust Emissions. Compliance with Rule 4.18 would limit fugitive dust (PM_{10} and $PM_{2.5}$) that may be generated during grading and construction activities. SDF-AQ-2 would implement a dust control plan that would further reduce fugitive dust.

The worker trip distance was assumed to be 35.415 miles, which is the estimated trip one-way length per employee from the OnTheMap application in Table 3.14-5, "Lassen County VMT Thresholds and Project Site Analysis," as described in Chapter 3.14, Transportation.[10] The vendor truck trip and haul truck trip distances were assumed to be the distance from the Lassen Facility to Susanville, the nearest city, which is approximately 75 miles.

Table 3.2-10. Lassen Facility Construction Scenario Assumptions

Construction Phase	Start Date	Finish Date	One-Way Vehicle Trips			Equipment		
			Average Daily Workers	Average Daily Vendor Trucks	Average Daily Haul Trucks	Type	Quantity	Usage Hours
Site Preparation	10/1/2024	11/1/2024	18	4	0	Rubber Tired Dozers	3	8
						Tractors/ Loaders/ Backhoes	4	8
Grading (Including	10/15/2024	5/15/2025	16	4	6	Excavators	1	8
						Graders	1	8

9 The analysis assumes a construction start date of October 2024, which represents the earliest date construction was anticipated to potentially initiate at the time the analysis was performed. Assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutant and GHG emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

10 The Table indicates that the daily (i.e., roundtrip) VMT for employees working in the Lassen Project Site Census Block is 70.83, half of which (i.e., one-way) is 35.415.

Table 3.2-10. Lassen Facility Construction Scenario Assumptions

Construction Phase	Start Date	Finish Date	One-Way Vehicle Trips			Equipment		
			Average Daily Workers	Average Daily Vendor Trucks	Average Daily Haul Trucks	Type	Quantity	Usage Hours
Utilities)						Rubber Tired Dozers	1	8
						Tractors/ Loaders/ Backhoes	3	8
Utility Line Stringing	5/16/2025	9/16/2025	24	4	0	Aerial Lifts	2	8
						Cranes	1	7
						Forklifts	2	8
						Generator Sets	2	8
						Tensioners[1]	2	8
Building/ Vertical Construction	1/16/2025	12/16/2025	200	52	0	Aerial Lifts	10	8
						Cranes	6	7
						Forklifts	10	8
						Generator Sets	10	8
						Light Towers[2]	10	8
						Rough Terrain Forklifts	5	8
						Tractors/ Loaders/ Backhoes	3	7
						Utility Vehicles[3]	20	8
						Welders	25	8
Rail Spurs Construction	2/15/2025	8/15/2025	10	4	0	Excavators	1	8
						Rubber Tired Dozers	1	8
						Tractors/ Loaders/ Backhoes	1	8
						Rail Tampers[4]	1	8
Paving	1/16/2025	3/15/2025	16	4	0	Pavers	2	8
						Paving Equipment	2	8

Table 3.2-10. Lassen Facility Construction Scenario Assumptions

Construction Phase	Start Date	Finish Date	One-Way Vehicle Trips			Equipment		
			Average Daily Workers	Average Daily Vendor Trucks	Average Daily Haul Trucks	Type	Quantity	Usage Hours
						Rollers	2	8
Architectural Coating	9/16/2025	11/30/2025	52	4	0	Air Compressors	1	6

Notes: See Appendix B1 for additional details.
1 Tensioners modeled as Other Construction Equipment in CalEEMod at 270 hp.
2 Light Towers modeled as Other General Industrial Equipment in CalEEMod at 35 hp.
3 Utility Vehicles modeled as Other Construction Equipment in CalEEMod at 20 hp with gasoline fuel.
4 Rail Tampers modeled as Other Construction Equipment in CalEEMod at 280 hp.

Internal combustion engines used by construction equipment, vendor trucks (i.e., delivery trucks), haul trucks, and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce VOC emissions.

Construction Ambient Air Quality Analysis

An ambient air quality impacts assessment was performed to assess the project's potential impact on the County meeting the CAAQS and NAAQS. As the Lassen County APCD does not have guidance for performing an ambient air quality analysis, the San Joaquin Valley APCD APR-1925 was followed as discussed below (San Joaquin Valley APCD 2019). The San Joaquin Valley APCD GAMAQI recommends preparing an AAQA if onsite emissions exceed 100 pounds per day.

For the initial assessment (Level 1) of the ambient air quality impact analysis, the maximum background concentration for the Lassen Facility for each pollutant and averaging period combination was added to the corresponding maximum GLC from project-related construction (Step 1). The sum of these values was then compared to the corresponding ambient air quality standard. If the incremental increase in concentration from 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 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 this second step, the maximum GLC of each pollutant and averaging period combination were compared to the screening thresholds found in Lassen County APCD Rule 6:9 – Air Quality Impact Analysis. The screening thresholds are used to evaluate whether the project's 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 GLC did not exceed the screening threshold, then the analysis was complete for that source/receptor/pollutant combination, and no further analysis was required.

For the Level 1 approach, in accordance with San Joaquin Valley APCD APR-1925, all required criteria pollutants are modeled together, with a normalized emission rate (1 gram/second) for each source. The dispersion modeling was performed using the American Meteorological Society/EPA Regulatory Model (AERMOD). AERMOD is a steady-state Gaussian plume model that incorporates air dispersion based on planetary boundary-layer turbulence structure and scaling concepts, including treatment of surface and elevated sources, building downwash, and simple and complex terrain (EPA 2023b). Principal parameters of this Level 1 modeling are presented in Table 3.2-11. Complete model results for the AAQA are included as Appendix B3.

Table 3.2-11. AERMOD Principal Parameters – Lassen Construction Air Quality Impact Assessment

<table>
<tr><th>Parameter</th><th colspan="4">Details</th></tr>
<tr><td>Meteorological Data</td><td colspan="4">The latest 5-year meteorological data (2016–2021) for the Alturas Municipal Airport (Station ID 725958) from CARB were downloaded and then input to AERMOD.</td></tr>
<tr><td>Urban versus Rural Option</td><td colspan="4">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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the rural dispersion option was selected due to the predominant land use surrounding the project.</td></tr>
<tr><td>Terrain Characteristics</td><td colspan="4">The terrain in the vicinity of the modeled project site is generally flat. The elevation of the modeled site is about 4,120 feet above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.</td></tr>
<tr><td>Elevation Data</td><td colspan="4">Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey’s National Elevation Dataset format with a 30-meter resolution.</td></tr>
<tr><td>Emission Sources</td><td colspan="4">Only onsite construction emissions were modeled for this assessment to determine the highest offsite concentration. For emission sources that extend offsite (haul trucks, train, etc.), the length of the source was limited to within the project boundary. Emissions were modeled using line-volume within AERMOD.</td></tr>
<tr><td rowspan="2">Source Release Characterizations</td><th>Source ID:</th><th>Source Name:</th><th>Source Type:</th><th>Source Parameters:</th></tr>
<tr><td>SLINE1</td><td>Offroad Equipment and Haul Trucks[a]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>Receptors</td><td colspan="4">A telescoping grid of receptors was placed around the project site boundary in the following spacing: 25-meter spacing on the facility boundary; 25-meter spacing from the 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 1,000 meters; and 500-meter spacing from 1,000 meters to 2,000 meters.</td></tr>
</table>

Sources: [a] EPA 2023b.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
See Appendix B3 for additional information.

Operational Mass Emissions

Project operational activities at the Lassen Facility would potentially generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from area sources, energy sources, mobile sources, off-road equipment, and stationary sources (permitted equipment), which are discussed below. Emissions from the operational phase of the project were estimated using a combination of CalEEMod Version 2022.1.1.25 and a spreadsheet model based on industry standard emission factors and project-specific information. Operational year 2025 was conservatively assumed; however, operation would not overlap with construction.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use and the reapplication of architectural coatings. Emissions from hearths and landscape maintenance equipment were not assumed to be applicable to this project.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2022). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of nonresidential and residential buildings and on the default factor of pounds of VOC per building square foot per day. For the asphalt surface land uses, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on the square footage of parking 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 paints and primers, used during building maintenance. CalEEMod calculates the ROG (VOC) evaporative emissions from application of nonresidential and residential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings. The CalEEMod default values of 250 g/L were assumed for non-residential interior and exterior coatings and parking paint. 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 and residential surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating (CAPCOA 2022).

Default CalEEMod values were applied for consumer products and reapplication of architectural coating based on the land use inputs for the project.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity. 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, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

Electricity consumption was provided by the project applicant and estimated to be 142,677,840 kWh per year. There would be no natural gas consumption at the Lassen Facility. However, propane would be consumed at the Lassen Facility to power some of the stationary sources. The propane consumption is provided in Section 3.5, Energy, of this EIR.

Mobile Sources

Mobile sources for the Lassen Facility that were modeled in CalEEMod would be employees, vendor trucks, and ash removal trucks traveling to and from the Lassen Facility. Logging/haul trucks would also be traveling to and from the Lassen Facility; however, the methodology for calculating emissions associated with feedstock logging/haul trucks was described in above in Section 3.2.4.1.1, Feedstock Acquisition. Trains would also be traveling to and from the Lassen Facility; however, the methodology for calculating emissions association with rail transport is described in Section 3.2.4.1.3 below.

Operations at the facility would occur 7 days per week. As described in Section 3.14, Transportation, the facility would require 60 employees, resulting in 120 daily one-way trips, and 1 ash removal truck per day, resulting in 2 daily one-way trips. It was conservatively assumed that there would be 2 vendor trucks per day to deliver materials and perform intermittent maintenance, resulting in 4 daily one-way trips. The worker trip distance was assumed to be 35.415 miles, which is the estimated one-way trip length per employee from the OnTheMap application in the Lassen County VMT per Employee Summary as described in Section 3.14, Transportation. The vendor truck trip and ash removal truck trip distances were assumed to be the distance from the Lassen Facility to Susanville, the nearest city, which is approximately 75 miles.

Project-related traffic was assumed to include a mixture of vehicles in accordance with the associated use, as modeled within CalEEMod, which is based on the CARB EMFAC2021 model. The CalEEMod default fleet mix is a weighted fleet mix of all vehicles in the project region and is appropriate for most land use projects. However, as the project is manufacturing facility, vehicle trips are anticipated to be heavy-duty trucks and employee vehicles. The vehicle fleet mix was adjusted in CalEEMod based on the daily trips of the vehicle categories described above. Emission factors representing the vehicle mix and emissions for 2025 were used to estimate emissions associated with vehicular sources. To reflect the anticipated vehicles associated with the project, the CalEEMod default fleet mix was adjusted in accordance with the projects traffic analysis to reflect 10% non-logging haul and vendor trucks and 90% passenger vehicles.

Off-Road Equipment

It was assumed that 1 rough terrain forklift would operate in the log storage area, 1 tractor/loader/backhoe would operate in the fuel storage area, and 1 rubber tired loader would operate in the dryer furnace area. CalEEMod was used to estimate criteria air pollutant emissions of the operational off-road equipment assuming 24 hours of operation per day for 48 weeks per year. The operational off-road equipment information was provided by the applicant.

Permitted Sources Facility Emissions

Raw Material Handling

The project will generate PM emissions from receiving and storage of raw wood materials consisting of roundwood and green residuals. Emissions of PM (including PM, PM_{10}, and $PM_{2.5}$) were estimated using the gross throughput of roundwood and green residuals (651,400 short tons per year [STPY] each). Roundwood receiving includes processing through truck unloading, log pile, drum debarker, and wood chipper. Green residuals are received at the facility in the form of wood chips, and receiving consists of truck unloading. Upon completion of receiving, all the resulting raw material, now in the form of chips, is processed through woodyard chip screening (1,302,799 STPY); woodyard fuel screening (117,872 STPY, consisting of the material screened out in the prior step); wood chip piles (1,184,927 STPY, consisting of the remaining material); and green hammermill screening (1,184,927 STPY). Emission factors for each stage in this process were derived from the US EPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (EPA 2006).

Green Hammermill

The project will use a green hammermill to reduce the size of the green residuals for suitable size for drying. This process generates VOC and TAC emissions. However, the emissions from the process are recirculated into the process stream and not exhausted. Therefore, no emissions are emitted from the green hammermill. The PM emissions from the green hammermill screening are discussed above in the raw material handling section.

Dryer

A dryer is used by the project to reduce the moisture content of the green material. The emissions from the dryer include criteria air pollutant emissions from combustion of propane as well as VOC and TAC emissions from the drying of the pellets. The exhaust from the dryer is routed to a wet electrostatic precipitator (WESP) to reduce emissions of PM and a regenerative thermal oxidizer (RTO) to reduce emissions of CO, VOC, and TACs. Emission factors for the dryer were based on Georgia Environmental Protection Division (GAEPD) for rotary dryer, direct wood-fueled, processing green softwood at wood pellet manufacturing facility and US EPA AP-42 Section 10.6.2 *Particle Board Manufacturing*, Table 10.6.2-3 at particleboard manufacturing facility. Per the manufacturer's specifications, the WESP has a PM efficiency of 99% and the RTO has a CO and TAC efficiency of 50% and 95%, respectively. The annual throughput of the dryer (946,312 oven dried tons) is based on the maximum dry hammermill throughput. Oven dried tons is considered to equate to 10% moisture content.[11]

Furnace Abort Operation

There are times when the RTO and WESP are down for maintenance or other reason and emissions from the dryer are not controlled. It was assumed that up to 8 hours per month the RTO and WESP would not be operating on the dryer. The emissions were based on the heat input of 160.6 million British thermal units per hour (MMBtu/hr) and emission factors from US EPA AP-42 Section 1.6, *Wood Residue Combustion*, Tables 1.6-1, 1.6-2, 1.6-3, and 1.6-4 (EPA 2022).

RTO

The RTO is used to reduce emissions of CO and TACs from the dryer. The RTO operates on propane and the combustion emits criteria air pollutants and TACs. The RTO is rated at 11.4 MMBtu/hr and is assumed to operate 8,040 hours per year. Emissions were estimated based on emission factors from the US EPA AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion* (EPA 2008b) and Section 1.4, *Natural Gas Combustion* (EPA 1998a).

Dry Material Storage

The project will emit PM, VOC, and TAC emissions during the receiving and storage of dried material after they leave the dryer. PM emissions were estimated based on the dry chip storage throughput (946,312 STPY) and emission factors from US EPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (EPA 2006). The material was assumed to have a moisture content of 10%. VOC and TAC emissions were estimated based on emission factors from GAEPD for storage/handling at a wood pellet manufacturing facility.

[11] In this and subsequent stages in the process, the progressively decreasing tonnage is the result of drying and reduced moisture content occurring as the raw materials are processed into pellets.

Dry Hammermill

The dried material is then routed to a dry hammermill to reduce the size of the material even further before processing into pellets. The dry hammermill generates PM, VOC, and TAC emissions during its process. The PM emissions are based on the annual throughput of 946,312 STPY and emission factors from the cyclone vendor. The VOC and TAC emissions were based on the throughput and emission factors from the GAEPD for hammermill at a wood pellet manufacturing facility. The dry hammermill exhaust is also routed to a regenerative catalytic oxidizer (RCO) to reduce emissions of VOC and TACs by 95%.

Pelleting System

Material that is reduced by the dry hammermill is routed to the pelleting system. The formation of pellets generates emissions of PM, VOC, and TACs. The PM emissions are based on the annual throughput of 877,753 STPY and emission factors from the baghouse vendor. The VOC and TAC emissions were based on the throughput and emission factors from the GAEPD for pelletizer/pellet cooler at a wood pellet manufacturing facility. The pelleting system exhaust is also routed to the RCO to reduce emissions of VOC and TACs.

Pellet Storage

The storage and loadout of pellets will generator PM, VOC, and TAC emissions. PM emissions were estimated using the pellet storage annual throughput of 771,618 STPY and emission factors from the dust collector vendor. The VOC and TAC emissions were based on the throughput and emission factors from the GAEPD for storage/handling at a wood pellet manufacturing facility. The pellet storage exhaust is also routed to the RCO to reduce emissions of VOC and TACs.

RCO

The RCO is used to reduce emissions of VOC and TACs from the dry hammermill, pelleting, and pellet storage from the project. The RCO operates on propane and the combustion emits criteria air pollutants and TACs. The RCO is rated at 8.3 MMBtu/hr and is assumed to operate 8,040 hours per year. Emissions were estimated based on emission factors from the US EPA AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion* (EPA 2008b) and Section 1.4, *Natural Gas Combustion* (EPA 1998a).

Fire Pump

The project includes a diesel fire pump for use in case there is a fire. The fire pump is rated at 150 horsepower and is assumed to operate up to 200 hours per year for maintenance and testing. Emissions of criteria air pollutants and TACs were estimated using emission factors from the US EPA AP-42 Section 3.3, *Gasoline and Diesel Industrial Engines*, Table 3.3-1 and 3.3-2 (EPA 1996a).

Operational Ambient Air Quality Analysis

An ambient air quality impacts assessment was performed to assess the project's potential impact on the County meeting the CAAQS and NAAQS. As the Lassen County APCD does not have guidance for performing an ambient air quality analysis, the San Joaquin Valley APCD APR-1925 was followed as discussed below (San Joaquin Valley APCD 2019). The San Joaquin Valley APCD GAMAQI recommends preparing an AAQA if onsite emissions exceed 100 pounds per day.

The dispersion modeling was performed using the AERMOD. Principal parameters of this Level 1 modeling are presented in Table 3.2-12. Complete model results for the AAQA are included as Appendix B3.

Table 3.2-12. AERMOD Principal Parameters – Lassen Operational Air Quality Impact Assessment

<table>
<tr><th>Parameter</th><th colspan="4">Details</th></tr>
<tr><td>Meteorological Data</td><td colspan="4">The latest 5-year meteorological data (2016–2021) for the Alturas Municipal Airport (Station ID 725958) from CARB were downloaded and then input to AERMOD.</td></tr>
<tr><td>Urban versus Rural Option</td><td colspan="4">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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the rural dispersion option was selected due to the predominant land use surrounding the project.</td></tr>
<tr><td>Terrain Characteristics</td><td colspan="4">The terrain in the vicinity of the modeled project site is generally flat. The elevation of the modeled site is about 4,120 feet above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.</td></tr>
<tr><td>Elevation Data</td><td colspan="4">Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey’s National Elevation Dataset format with a 30-meter resolution.</td></tr>
<tr><td>Emission Sources</td><td colspan="4">Only onsite operational emissions were modeled for this assessment to determine the highest offsite concentration. For emission sources that extend offsite (rail and haul trucks), the length of the source was limited to within the project boundary. Emissions were modeled using line-volume, point, and area sources within AERMOD.</td></tr>
<tr><td rowspan="7">Source Release Characterizations</td><th>Source ID:</th><th>Source Name:</th><th>Source Type:</th><th>Source Parameters:</th></tr>
<tr><td>SLINE1</td><td>Rail Travel[a]</td><td>Line Volume</td><td>Plume Height: 9.7 m
Plume Width: 4.05 m
Release Height: 4.85 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE2</td><td>Haul Truck Emissions[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE4</td><td>Wheeled Offroad Equipment[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE5</td><td>Offroad Equipment Fuel Storage[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE6</td><td>Offroad Equipment Dryer Furnace[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>PAREA1</td><td>Log Pile[c]</td><td>Area Poly</td><td>Release Height: 1 m
Emission Rate: 1 g/s</td></tr>
</table>

Table 3.2-12. AERMOD Principal Parameters – Lassen Operational Air Quality Impact Assessment

Parameter	Details			
				Area: 133,491.7 m^2
	PAREA2	Woodyard Chip Piles[c]	Area Poly	Release Height: 25.908 m Initial Vertical Dimension: 51.82 m Emission Rate: 1 g/s Area: 10,353.5 m^2
	VOL1	Drum Debarker[c]	Volume	Release Height: 7.62 m Length of Side: 64.73 m Initial Lateral Dimension: 15.05 m Initial Vertical Dimension: 1.77 m Emission Rate: 1 g/s
	VOL2	Roundwood Truck Unloading[c]	Volume	Release Height: 3.4 m Length of Side: 66.3 m Initial Lateral Dimension: 15.42 m Initial Vertical Dimension: 1.58 m Emission Rate: 1 g/s
	VOL3	Log Chipper[c]	Volume	Release Height: 4.572 m Length of Side: 34.94 m Initial Lateral Dimension: 8.13 m Initial Vertical Dimension: 9.14 m Emission Rate: 1 g/s
	VOL4	Residuals Truck Unloading Dust[c]	Volume	Release Height: 3.048 m Length of Side: 60.08 m Initial Lateral Dimension: 13.97 m Initial Vertical Dimension: 1.42 m Emission Rate: 1 g/s
	VOL5	Woodyard Chip Screening[c]	Volume	Release Height: 10.668 m Length of Side: 30.57 m Initial Lateral Dimension: 7.11 m Initial Vertical Dimension: 4.96 m Emission Rate: 1 g/s
	VOL6	Woodyard Fuel Screening[c]	Volume	Release Height: 10.668 m Length of Side: 41.11 m Initial Lateral Dimension: 9.56 m Initial Vertical Dimension: 4.96 m Emission Rate: 1 g/s
	VOL7	Green Hammermill Screening[c]	Volume	Release Height: 21.336 m Length of Side: 28.46 m Initial Lateral Dimension: 6.62 m Initial Vertical Dimension: 9.92 m Emission Rate: 1 g/s
	VOL8	Dry Chips Storage[c]	Volume	Release Height: 21.336 m Length of Side: 24.24 m Initial Lateral Dimension: 5.64 m Initial Vertical Dimension: 9.92 m Emission Rate: 1 g/s

Table 3.2-12. AERMOD Principal Parameters – Lassen Operational Air Quality Impact Assessment

Parameter	Details			
	STCK1	Rail Idling[a]	Point	Release Height: 4.9 m Emission Rate: 1.0 g/s Gas Exit Temperature: 195.53 F Stack Inside Diameter: 0.6 m Gas Exit Velocity: 3.1 m/s
	STCK2	Dryer[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.929 m Gas Exit Velocity: 37.559 m/s
	STCK3	RCO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.996 m Gas Exit Velocity: 0.004 m/s
	STCK4	RTO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.929 m Gas Exit Velocity: 0.012 m/s
	STCK5	Furnace Abort[c]	Point	Release Height: 26.213 m Emission Rate: 1.0 g/s Gas Exit Temperature: 1,335.0 F Stack Inside Diameter: 1.289 m Gas Exit Velocity: 80.685 m/s
	STCK6	Dry Hammermill[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 2.997 m Gas Exit Velocity: 6.69 m/s
	STCK7	Pellet Mill and Cooler[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.997 m Gas Exit Velocity: 6.689 m/s
	STCK8	Pellet Storage[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 2.997 m Gas Exit Velocity: 3.345 m/s
	STCK9	Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1.0 g/s Gas Exit Temperature: 300.0 F Stack Inside Diameter: 0.101 m Gas Exit Velocity: 45.438 m/s

Table 3.2-12. AERMOD Principal Parameters – Lassen Operational Air Quality Impact Assessment

Parameter	Details
Receptors	A telescoping grid of receptors was placed around the project site boundary in the following spacing: 25-meter spacing on the facility boundary; 25-meter spacing from the 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 1,000 meters; and 500-meter spacing from 1,000 meters to 2,000 meters.

Sources: [a] Port of Stockton 2021; [b] EPA 2023b; [c] Nexus 2024.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
See Appendix B3 for additional information.

Health Risk Assessment

The greatest potential for TAC emissions during project construction would be DPM emissions from heavy equipment operations and heavy-duty trucks. During operation, the project would emit DPM from offroad, onroad, and rail sources in addition to TACs from various processes at the plant. As a precautionary measure, an HRA was performed to assess the impact of construction and operation on sensitive receptors proximate to the Lassen Facility and along key travel corridors. Complete model results for the HRA are included as Appendix B4. For risk assessment purposes, PM_{10} in diesel exhaust is considered a proxy for DPM.[12] Emissions of TACs during construction were estimated using CalEEMod. During operation, emissions of TACs were estimated using CalEEMod and a spreadsheet model with emission factors from US EPA AP-42 and GAEPD.

The HRA applies the methodologies prescribed in the Office of Environmental Health Hazard Assessment (OEHHA) document, Air Toxics Hot Spots Program Risk Assessment Guidelines – Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015). Cancer risk parameters, such as age-sensitivity factors, daily breathing rates, exposure period, fraction of time at home, and cancer potency factors were based on the values and data recommended by OEHHA are implemented in CARB's Hotspots Analysis and Reporting Program Version 2 (HARP2), which was used to estimate risk from construction activities.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. Lassen County APCD has not established a carcinogenic (cancer) risk or health hazard threshold for CEQA purposes; however, a cancer risk threshold of 10 in one million and a Chronic Hazard Index significance of 1.0 was applied for the Lassen Facility impact analysis consistent with the Lassen County APCD's implementation of AB 2588 Air Toxics Hots Spots Information and Assessment Act program (Lassen County APCD 2020). For context, the National Cancer Institute estimates that approximately 40.5% of people will be diagnosed with cancer during their lifetimes (National Cancer Institute 2024). A cancer risk of 10 in a million indicates that a person has an additional risk of 10 chances in a million (0.001%) of developing cancer during their lifetime as a result of the air pollution scenario being evaluated, which is minimal and defined as the "No Significant Risk Level" for carcinogens in Proposition 65. Additionally, some TACs increase noncancer health risk due to long-term (chronic) exposures. The Chronic Hazard Index is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system.

12 Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. The California EPA is a proponent of using the surrogate approach to quantifying cancer risks associated with diesel exhaust over a component-based approach, which involves estimating risks for each of the individual components of a mixture. The California EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components" (OEHHA 2003).

A dispersion modeling analysis was conducted of TACs emitted from the project to assess the health risk impacts of the construction and operation on proximate existing off-site sensitive receptors.

The dispersion modeling was performed using AERMOD, which is the model Lassen County APCD requires for atmospheric dispersion of emissions. The dispersion modeling included the use of standard regulatory default options. AERMOD parameters were selected consistent with the EPA guidance and identified as representative of the project site and project activities. Principal parameters of this modeling are presented in Table 3.2-13.

Table 3.2-13. AERMOD Principal Parameters – Lassen Health Risk Assessment

<table>
<tr><th>Parameter</th><th colspan="4">Details</th></tr>
<tr><td>Meteorological Data</td><td colspan="4">The latest 5-year meteorological data (2016–2021) for the Alturas Municipal Airport (Station ID 725958) from CARB were downloaded and then input to AERMOD.</td></tr>
<tr><td>Urban versus Rural Option</td><td colspan="4">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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the rural dispersion option was selected due to the predominant land use surrounding the project.</td></tr>
<tr><td>Terrain Characteristics</td><td colspan="4">The terrain in the vicinity of the modeled project site is generally flat. The elevation of the modeled site is about 4,120 feet above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.</td></tr>
<tr><td>Elevation Data</td><td colspan="4">Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey's National Elevation Dataset format with a 30-meter resolution.</td></tr>
<tr><td>Emission Sources</td><td colspan="4">Emissions from onsite and offsite sources (rail and haul trucks) were modeled within a 8 kilometer grid around the project site.</td></tr>
<tr><td rowspan="5">Source Release Characterizations - Construction</td><th>Source ID:</th><th>Source Name:</th><th>Source Type:</th><th>Source Parameters:</th></tr>
<tr><td>SLINE1</td><td>Offroad Equipment[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 0.753 g/s[1]</td></tr>
<tr><td>SLINE2</td><td>Haul Trucks SW[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 0.527 g/s[2]</td></tr>
<tr><td>SLINE3</td><td>Haul Trucks NE[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 0.473 g/s[2]</td></tr>
<tr><td>SLINE4</td><td>Offroad Equipment[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 0.247 g/s[1]</td></tr>
</table>

Table 3.2-13. AERMOD Principal Parameters – Lassen Health Risk Assessment

Parameter	Details			
Source Release Characterizations - Operation	**Source ID:**	**Source Name:**	**Source Type:**	**Source Parameters:**
	SLINE1	Rail Travel[a]	Line Volume	Plume Height: 9.7 m Plume Width: 4.05 m Release Height: 4.85 m Emission Rate: 1 g/s
	SLINE2	Haul Trucks SW[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.527 g/s[3]
	SLINE3	Haul Trucks NE[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.473 g/s[3]
	SLINE5	Wheeled Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	SLINE6	Offroad Equipment Dryer Furnace[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	SLINE7	Offroad Equipment Fuel Storage[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	VOL8	Dry Chips Storage[c]	Volume	Release Height: 21.336 m Length of Side: 24.24 m Initial Lateral Dimension: 5.64 m Initial Vertical Dimension: 9.92 m Emission Rate: 1 g/s
	STCK1	Rail Idling[a]	Point	Release Height: 4.9 m Emission Rate: 1.0 g/s Gas Exit Temperature: 195.53 F Stack Inside Diameter: 0.6 m Gas Exit Velocity: 3.1 m/s
	STCK2	Dryer[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.929 m Gas Exit Velocity: 37.559 m/s
	STCK3	RCO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.996 m

Table 3.2-13. AERMOD Principal Parameters – Lassen Health Risk Assessment

Parameter	Details			
				Gas Exit Velocity: 0.004 m/s
	STCK4	RTO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.929 m Gas Exit Velocity: 0.012 m/s
	STCK5	Furnace Abort[c]	Point	Release Height: 26.213 m Emission Rate: 1.0 g/s Gas Exit Temperature: 1,335.0 F Stack Inside Diameter: 1.289 m Gas Exit Velocity: 80.685 m/s
	STCK6	Dry Hammermill[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 2.997 m Gas Exit Velocity: 6.69 m/s
	STCK7	Pellet Mill and Cooler[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.997 m Gas Exit Velocity: 6.689 m/s
	STCK8	Pellet Storage[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 2.997 m Gas Exit Velocity: 3.345 m/s
	STCK9	Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1.0 g/s Gas Exit Temperature: 300.0 F Stack Inside Diameter: 0.101 m Gas Exit Velocity: 45.438 m/s
Receptors	Discrete cartesian receptors were placed on sensitive receptors in close proximity to the project site and haul truck/rail routes.			

Sources: [a] Port of Stockton 2021; [b] EPA 2023b; [c] Nexus 2024.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
1 An emission rate of 1 g/s was divided equally between the number of volume sources within the sources modeled.
2 An emission rate of 1 g/s was divided equally between the number of volume sources within the sources modeled.
3 An emission rate of 1 g/s was divided equally between the number of volume sources within the sources modeled.
See Appendix B4 for additional information.

AERMOD was run with all sources emitting unit emissions (1 gram per second) to obtain the necessary input values for CARB's Hotspots Analysis and Reporting Program Version 2 (HARP2). The line of volume sources was partitioned evenly based on the 1 gram per second emission rate. The ground-level concentration plot files were then used to estimate the long-term cancer health risk to an individual, and the noncancerous chronic health indices.

Dispersion model plotfiles from AERMOD were then imported into CARB's HARP2 to determine health risk, which requires peak 1-hour emission rates and annual emission rates for all pollutants for each modeling source. The exposure duration for the construction emissions was 1.25 years starting in the 3rd trimester of pregnancy. The operational exposure duration was assumed to be 30 years starting in the 3rd trimester of pregnancy. The results from the construction and operational assessment were summed to provide the combined risk results from the project. The risk results were then compared to Lassen County APCD thresholds to assess project impact significance.

Tuolumne Facility

SDFs are incorporated as enforceable best practices to reduce criteria air pollutant emissions and other environmental impacts, which include SDF-AQ-1, SDF-AQ-2, and SDF-AQ-3 as introduced under the Lassen Facility. SDF-AQ-1 requires all project activities to comply with the applicable air district requirements. SDF-AQ-2 requires the project to implement a construction fugitive dust control plan to reduce project-generated dust. SDF-AQ-3 requires the project to implement an odor abatement plan.

Construction Mass Emissions

For purposes of estimating project emissions, and based on information provided by the project applicant, it is assumed that construction of the Tuolumne Facility would commence in October 2024 and would last approximately 15 months, ending in December 2025.[13] Table 3.2-14 presents the construction scenario assumptions used for estimating construction emissions of the Tuolumne Facility in CalEEMod. The construction schedule and equipment load has been developed based on available information provided by the project applicant, typical construction practices, and CalEEMod default assumptions.

Construction of the Tuolumne facility would generate criteria air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, and asphalt pavement application. An approximately 6,000 square foot building is on the existing site and would be demolished. An estimated 114,675 cubic yards of soils would be exported during the grading phase, resulting in 166 one-way haul truck trips per day. Vendor and haul trucks during the Demolition, Site Preparation, and Grading phases were also modeled as on-site trucks in CalEEMod and were assumed to travel on-site for approximately 0.25 miles. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Standard construction practices that would be employed to reduce fugitive dust emissions include watering of the active sites two times per day, depending on weather conditions. SDF-AQ-2 would implement a dust control plan that would further reduce fugitive dust emissions.

The worker trip distance was assumed to be 50.2 miles, which is the estimated one-way trip length per employee from Table 3.14-6, “Summary of Project Area VMT,” as described in Chapter 3.14, Transportation. [14] The vendor trip and haul truck trip distances were assumed to be the distance from the Tuolumne Facility to Modesto, the nearest city, which is approximately 35 miles.

[13] The analysis assumes a construction start date of October 2024, which represents the earliest date construction was anticipated to potentially initiate at the time the analysis was performed. Assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutant and GHG emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

[14] The Table indicates that the daily (i.e., roundtrip) VMT for employees working in the Lake Don Pedro Subarea of Tuolumne County, where the project is located, is 100.4, half of which (i.e., one-way) is 50.2.

Table 3.2-14. Tuolumne Facility Construction Scenario Assumptions

Construction Phase	Start Date	Finish Date	One-Way Vehicle Trips			Equipment		
			Average Daily Workers	Average Daily Vendor Trucks	Average Daily Haul Trucks	Type	Quantity	Usage Hours
Demolition	10/1/2024	12/1/2024	18	4	2	Concrete/ Industrial Saws	1	8
						Crawler Tractors	1	8
						Excavators	3	8
						Rubber Tired Loaders	2	8
Site Preparation	11/15/2024	12/1/2024	18	4	0	Rubber Tired Dozers	3	8
						Tractors/ Loaders/ Backhoes	4	8
Grading (Including Utilities)	12/1/2024	4/1/2025	16	4	166	Excavators	1	8
						Graders	1	8
						Rubber Tired Dozers	1	8
						Tractors/ Loaders/ Backhoes	3	8
Utility Line Stringing	4/2/2025	8/2/2025	24	4	0	Aerial Lifts	2	8
						Cranes	1	7
						Forklifts	2	8
						Generator Sets	2	8
						Tensioners[1]	2	8
Building/ Vertical Construction	2/1/2025	12/1/2025	108	42	0	Cranes	5	7
						Forklifts	8	8
						Generator Sets	6	8
						Tractors/ Loaders/ Backhoes	3	7
						Welders	20	8
Rail Spurs Construction	1/1/2025	5/1/2025	10	4	0	Excavators	1	8
						Rubber Tired Dozers	1	8
						Tractors/ Loaders/ Backhoes	1	8

Table 3.2-14. Tuolumne Facility Construction Scenario Assumptions

Construction Phase	Start Date	Finish Date	One-Way Vehicle Trips			Equipment		
			Average Daily Workers	Average Daily Vendor Trucks	Average Daily Haul Trucks	Type	Quantity	Usage Hours
						Rail Tampers[2]	1	8
Paving	2/1/2025	4/1/2025	16	4	0	Pavers	2	8
						Paving Equipment	2	8
						Rollers	2	8
Architectural Coating	11/1/2025	11/30/2025	44	4	0	Air Compressors	1	6

Notes: See Appendix B1 for additional details.
1 Tensioners modeled as Other Construction Equipment in CalEEMod at 270 hp.
2 Rail Tampers modeled as Other Construction Equipment in CalEEMod at 280 hp.

Internal combustion engines used by construction equipment, vendor trucks (i.e., delivery trucks), haul trucks, and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce VOC emissions.

Construction Ambient Air Quality Analysis

An ambient air quality analysis was performed to assess the project's potential impact on the County meeting the CAAQS and NAAQS. As the Tuolumne County APCD does not have guidance for performing an ambient air quality analysis, the San Joaquin Valley APCD APR-1925 was followed as discussed below (San Joaquin Valley APCD 2019). The San Joaquin Valley APCD GAMAQI recommends preparing an AAQA if onsite emissions exceed 100 pounds per day. AERMOD. Principal parameters of this Level 1 modeling are presented in Table 3.2-15. Complete model results for the AAQA are included as Appendix B3.

Table 3.2-15. AERMOD Principal Parameters – Tuolumne Construction Air Quality Impact Assessment

Parameter	Details
Meteorological Data	The latest 5-year meteorological data (2018–2022) for the Modesto Station (Station ID 23258) from the San Joaquin Valley APCD were downloaded and then input to AERMOD.
Urban versus Rural Option	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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the rural dispersion option was selected due to the predominant land use surrounding the project.
Terrain Characteristics	The terrain in the vicinity of the modeled project site is generally hilly. The elevation of the modeled site is about 1,107 feet above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.
Elevation Data	Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD

Table 3.2-15. AERMOD Principal Parameters – Tuolumne Construction Air Quality Impact Assessment

<table>
<tr><th>Parameter</th><th colspan="4">Details</th></tr>
<tr><td></td><td colspan="4">View in the U.S. Geological Survey's National Elevation Dataset format with a 30-meter resolution.</td></tr>
<tr><td>Emission Sources</td><td colspan="4">Only onsite operational emissions were modeled for this assessment to determine the highest offsite concentration. For emission sources that extend offsite (haul trucks), the length of the source was limited to within the project boundary. Emissions were modeled using line-volume sources within AERMOD.</td></tr>
<tr><td rowspan="2">Source Release Characterizations</td><td>Source ID:</td><td>Source Name:</td><td>Source Type:</td><td>Source Parameters:</td></tr>
<tr><td>SLINE3</td><td>Offroad Equipment and Haul Trucks[a]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>Receptors</td><td colspan="4">A telescoping grid of receptors was placed around the project site boundary in the following spacing: 25-meter spacing on the facility boundary; 25-meter spacing from the 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 1,000 meters; and 500-meter spacing from 1,000 meters to 2,000 meters.</td></tr>
</table>

Sources: [a] EPA 2023b.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
See Appendix B3 for additional information.

Operational Mass Emissions

Project operational activities at the Tuolumne Facility would potentially generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from area sources, energy sources, mobile sources, off-road equipment, and permitted sources, which are discussed below. Emissions from the operational phase of the project were estimated using a combination of CalEEMod Version 2022.1.1.25 and a spreadsheet model based on industry standard emission factors and project-specific information. Operational year 2025 was conservatively assumed; however, operation would not overlap with construction.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use and the reapplication of architectural coatings. Emissions from hearths and landscape maintenance equipment were not assumed to be applicable to this project.

The description of the consumer products and reapplication of architectural coating provided for the Lassen Facility operational area sources are the same for the Tuolumne Facility. Default CalEEMod values were applied for consumer products and the reapplication of architectural coating based on the land use inputs for the project.

Energy Sources

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

Electricity consumption was provided by the project applicant and estimated to be 94,807,680 kWh per year. There would be no natural gas consumption at the Tuolumne Facility. However, propane would be consumed at the Tuolumne Facility to power some of the stationary sources. The propane consumption is provided in Chapter 3.5, Energy, of this EIR.

Mobile Sources

Mobile sources for the Tuolumne Facility would be employees, vendor trucks, and ash removal trucks traveling to and from the facility. Logging/haul trucks would also be traveling to and from the Tuolumne Facility; however, the methodology for calculating emissions associated with feedstock was described in above in Section 3.2.4.1.1, Feedstock Acquisition. Trains would also be traveling to and from the Tuolumne Facility; however, the methodology for calculating emissions association with rail transport is described in Section 3.2.4.1.3 below.

Operations at the facility would occur 7 days per week. As described in Chapter 3.14, Transportation, the facility would require 51 workers, resulting in 102 daily one-way trips, and 1 ash removal truck per day, resulting in 2 daily one-way trips. It was conservatively assumed that there would be 2 vendor trucks per day to deliver materials and perform intermittent maintenance, resulting in 4 daily one-way trips. The worker trip distance was assumed to be 50.2 miles, which is the estimated one-way trip length per employee from the Tuolumne County VMT Summary as described in Chapter 3.14, Transportation. The vendor truck trip and ash truck trip distances were assumed to be the distance from the Tuolumne Facility to Modesto, the nearest city, which is approximately 35 miles. The fleet mix was adjusted in CalEEMod based on the daily trips of the vehicle categories described above.

Project-related traffic was assumed to include a mixture of vehicles in accordance with the associated use, as modeled within CalEEMod, which is based on the CARB EMFAC2021 model. The CalEEMod default fleet mix is a weighted fleet mix of all vehicles in the project region and is appropriate for most land use projects. However, as the project is manufacturing facility, vehicle trips are anticipated to be heavy-duty trucks and employee vehicles. The vehicle fleet mix was adjusted in CalEEMod based on the daily trips of the vehicle categories described above. Emission factors representing the vehicle mix and emissions for 2025 were used to estimate emissions associated with vehicular sources. To reflect the anticipated vehicles associated with the project, the CalEEMod default fleet mix was adjusted in accordance with the projects traffic analysis to reflect 4% non-logging haul and vendor trucks and 96% passenger vehicles.

Off-Road Equipment

It was assumed that 1 rough terrain forklift would operate in the log storage area, 1 tractor/loader/backhoe would operate in the fuel storage area, and 1 rubber tired loader would operate in the dryer furnace area. CalEEMod was used to estimate criteria air pollutant emissions of this operational off-road equipment assuming 24 hours of operation per day for 48 weeks per year. Furthermore, 1 railcar mover (i.e., trackmobile) would move the train cars. In CalEEMod, the railcar mover was modeled as “Other Construction Equipment” at 200 horsepower and assuming 4 hours of operation per day for 48 weeks per year. The operational off-road equipment information was provided by the applicant.

Permitted Sources Facility Emissions

Raw Material Handling

The project will generate PM emissions from receiving and storage of raw wood materials consisting of roundwood and green residuals. Emissions of PM (including PM, PM_{10}, and $PM_{2.5}$) were estimated using the gross throughput of roundwood (322,704 STPY) and green residuals (264,108 STPY). Roundwood receiving includes processing through truck unloading, log pile, drum debarker, and wood chipper. Green residuals are received at the facility in the form of wood chips, and receiving consists of truck unloading. Upon completion of receiving, all the resulting raw material, now in the form of chips, is processed through woodyard chip screening (586,811 STPY); woodyard fuel screening (67,938 STPY, consisting of the material screened out in the prior step); wood chip piles (518,874 STPY, consisting of the remaining material); and green hammermill screening (518,874 STPY). Emission factors for each stage in this process were derived from the US EPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (EPA 2006).

Green Hammermill

The project will use a green hammermill to reduce the size of the green residuals for suitable size for drying. This process generates VOC and TAC emissions. However, the emission from the process are recirculated into the process stream and not exhausted. Therefore, no emissions are emitted from the green hammermill. The PM emissions from the green hammermill screening are discussed above in the raw material handling section.

Dryer

A dryer is used by the project to reduce the moisture content of the green material. The emissions from the dryer include criteria air pollutant emissions from combustion of propane as well as VOC and TAC emissions from the drying of the pellets. The exhaust from the dryer is routed to a wet electrostatic precipitator (WESP) to reduce emissions of PM and a regenerative thermal oxidizer (RTO) to reduce emissions of CO, VOC, and TACs. Emission factors for the dryer were based on Georgia Environmental Protection Division (GAEPD) for rotary dryer, direct wood-fueled, processing green softwood at wood pellet manufacturing facility and US EPA AP-42 Section 10.6.2 *Particle Board Manufacturing*, Table 10.6.2-3 at particleboard manufacturing facility. Per the manufacturer's specifications, the WESP has a PM efficiency of 99% and the RTO has a CO and TAC efficiency of 50% and 95%, respectively. The annual throughput of the dryer (405,562 oven dried tons) is based on the maximum dry hammermill throughput. Oven dried tons is considered to equate to 10% moisture content.[15]

Furnace Abort Operation

There are times when the RTO and WESP are down for maintenance or other reason and emissions from the dryer are not controlled. It was assumed that up to 8 hours per month the RTO and WESP would not be operating on the dryer. The emissions were based on the heat input of 83.0 MMBtu/hr and emission factors from US EPA AP-42 Section 1.6, *Wood Residue Combustion*, Tables 1.6-1, 1.6-2, 1.6-3, and 1.6-4 (EPA 2022).

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15 In this and subsequent stages in the process, the progressively decreasing tonnage is the result of drying and reduced moisture content occurring as the raw materials are processed into pellets.

RTO

The RTO is used to reduce emissions of CO and TACs from the dryer. The RTO operates on propane and the combustion emits criteria air pollutants and TACs. The RTO is rated at 5.7 MMBtu/hr and is assumed to operate 8,040 hours per year. Emissions were estimated based on emission factors from the US EPA AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion* (EPA 2008b) and Section 1.4, *Natural Gas Combustion* (EPA 1998a).

Dry Material Storage

The project will emit PM, VOC, and TAC emissions during the receiving and storage of dried material after they leave the dryer. PM emissions were estimated based on the dry chip storage throughput (405,562 STPY) and emission factors from US EPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (EPA 2006). The material was assumed to have a moisture content of 10%. VOC and TAC emissions were estimated based on emission factors from GAEPD for storage/handling at a wood pellet manufacturing facility.

Dry Hammermill

The dried material is then routed to a dry hammermill to reduce the size of the material even further before processing into pellets. The dry hammermill generates PM, VOC, and TAC emissions during its process. The PM emissions are based on the annual throughput of 405,562 STPY and emission factors from the cyclone vendor. The VOC and TAC emissions were based on the throughput and emission factors from the GAEPD for hammermill at a wood pellet manufacturing facility. The dry hammermill exhaust is also routed to a regenerative catalytic oxidizer (RCO) to reduce emissions of VOC and TACs by 95%.

Pelleting System

Material that is reduced by the dry hammermill is routed to the pelleting system. The formation of pellets generates emissions of PM, VOC, and TACs. The PM emissions are based on the annual throughput of 370,800 STPY and emission factors from the baghouse vendor. The VOC and TAC emissions were based on the throughput and emission factors from the GAEPD for pelletizer/pellet cooler at a wood pellet manufacturing facility. The pelleting system exhaust is also routed to the RCO to reduce emissions of VOC and TACs.

Pellet Storage

The storage and loadout of pellets will generator PM, VOC, and TAC emissions. PM emissions were estimated using the pellet storage annual throughput of 330,693 STPY and emission factors from the dust collector vendor. The VOC and TAC emissions were based on the throughput and emission factors from the GAEPD for storage/handling at a wood pellet manufacturing facility. The pellet storage exhaust is also routed to the RCO to reduce emissions of VOC and TACs.

RCO

The RCO is used to reduce emissions of VOC and TACs from the dry hammermill, pelleting, and pellet storage from the project. The RCO operates on propane and the combustion emits criteria air pollutants and TACs. The RCO is rated at 8.3 MMBtu/hr and is assumed to operate 8,040 hours per year. Emissions were estimated based on emission factors from the US EPA AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion* (EPA 2008b) and Section 1.4, *Natural Gas Combustion* (EPA 1998a).

Fire Pump

The project includes a diesel fire pump for use in case there is a fire. The fire pump is rated at 150 horsepower and is assumed to operate up to 200 hours per year for maintenance and testing. Emissions of criteria air pollutants and TACs were estimated using emission factors from the US EPA AP-42 Section 3.3, *Gasoline and Diesel Industrial Engines*, Table 3.3-1 and 3.3-2 (EPA 1996a).

Operational Ambient Air Quality Analysis

An ambient air quality impacts assessment was performed to assess the project's potential impact on the County meeting the CAAQS and NAAQS during operation. As the Tuolumne County APCD does not have guidance for performing an ambient air quality analysis, the San Joaquin Valley APCD APR-1925 was followed as discussed below (San Joaquin Valley APCD 2019). The San Joaquin Valley APCD GAMAQI recommends preparing an AAQA if onsite emissions exceed 100 pounds per day. Principal parameters of this Level 1 modeling are presented in Table 3.2-16. Complete model results for the AAQA are included as Appendix B3.

Table 3.2-16. AERMOD Principal Parameters – Tuolumne Air Quality Impact Assessment

<table>
<tr><th>Parameter</th><th colspan="4">Details</th></tr>
<tr><td>Meteorological Data</td><td colspan="4">The latest 5-year meteorological data (2018–2022) for the Modesto Station (Station ID 23258) from the San Joaquin Valley APCD were downloaded and then input to AERMOD.</td></tr>
<tr><td>Urban versus Rural Option</td><td colspan="4">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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the rural dispersion option was selected due to the predominant land use surrounding the project.</td></tr>
<tr><td>Terrain Characteristics</td><td colspan="4">The terrain in the vicinity of the modeled project site is generally hilly. The elevation of the modeled site is about 1,107 feet above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.</td></tr>
<tr><td>Elevation Data</td><td colspan="4">Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey's National Elevation Dataset format with a 30-meter resolution.</td></tr>
<tr><td>Emission Sources</td><td colspan="4">Only onsite operational emissions were modeled for this assessment to determine the highest offsite concentration. For emission sources that extend offsite (rail and haul trucks), the length of the source was limited to within the project boundary. Emissions were modeled using line-volume, point, and area sources within AERMOD.</td></tr>
<tr><td rowspan="3">Source Release Characterizations</td><th>Source ID:</th><th>Source Name:</th><th>Source Type:</th><th>Source Parameters:</th></tr>
<tr><td>SLINE3</td><td>Rail Travel[a]</td><td>Line Volume</td><td>Plume Height: 9.7 m
Plume Width: 4.05 m
Release Height: 4.85 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE4</td><td>Offroad Equipment[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
</table>

Table 3.2-16. AERMOD Principal Parameters – Tuolumne Air Quality Impact Assessment

Parameter	Details			
	SLINE5	Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	SLINE6	Dryer Furnace Ash Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	SLINE7	Haul Trucks[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	PAREA1	Log Pile[c]	Area Poly	Release Height: 1 m Emission Rate: 1 g/s Area: 22,462.7 m^2
	PAREA2	Woodyard Chip Piles[c]	Area Poly	Release Height: 34.138 m Initial Vertical Dimension: 68.28 m Emission Rate: 1 g/s Area: 6,466.5 m^2
	VOL1	Roundwood and Residuals Truck Unloading[c]	Volume	Release Height: 3.4 m Length of Side: 30.82 m Initial Lateral Dimension: 7.17 m Initial Vertical Dimension: 1.58 m Emission Rate: 1 g/s
	VOL2	Drum Debarker[c]	Volume	Release Height: 7.62 m Length of Side: 27.74 m Initial Lateral Dimension: 6.45 m Initial Vertical Dimension: 3.54 m Emission Rate: 1 g/s
	VOL3	Chipper[c]	Volume	Release Height: 4.572 m Length of Side: 19.72 m Initial Lateral Dimension: 4.59 m Initial Vertical Dimension: 2.13 m Emission Rate: 1 g/s
	VOL4	Woodyard Chip Screening[c]	Volume	Release Height: 10.668 m Length of Side: 12.94 m Initial Lateral Dimension: 3.01 m Initial Vertical Dimension: 4.96 m Emission Rate: 1 g/s
	VOL5	Green Hammermill Screening[c]	Volume	Release Height: 13.716 m Length of Side: 19.72 m Initial Lateral Dimension: 4.59 m Initial Vertical Dimension: 6.38 m Emission Rate: 1 g/s
	VOL6	Dry Chips Storage[c]	Volume	Release Height: 18.288 m

Table 3.2-16. AERMOD Principal Parameters – Tuolumne Air Quality Impact Assessment

Parameter	Details			
				Length of Side: 19.72 m Initial Lateral Dimension: 4.59 m Initial Vertical Dimension: 8.51 m Emission Rate: 1 g/s
	STCK1	Dryer[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.93 m Gas Exit Velocity: 18.762 m/s
	STCK2	RTO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.93 m Gas Exit Velocity: 0.006 m/s
	STCK3	Furnace Abort[c]	Point	Release Height: 26.213 m Emission Rate: 1.0 g/s Gas Exit Temperature: 1,335.0 F Stack Inside Diameter: 1.295 m Gas Exit Velocity: 79.927 m/s
	STCK4	Dry Hammermill[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 2.996 m Gas Exit Velocity: 3.347 m/s
	STCK5	Pellet Mill[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.996 m Gas Exit Velocity: 3.347 m/s
	STCK6	RCO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.996 m Gas Exit Velocity: 0.004 m/s
	STCK7	Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1.0 g/s Gas Exit Temperature: 300.0 F Stack Inside Diameter: 0.101 m Gas Exit Velocity: 45.438 m/s
	STCK8	Rail Idling[a]	Point	Release Height: 4.9 m Emission Rate: 1.0 g/s Gas Exit Temperature: 195.53 F Stack Inside Diameter: 0.6 m Gas Exit Velocity: 3.1 m/s

Table 3.2-16. AERMOD Principal Parameters – Tuolumne Air Quality Impact Assessment

Parameter	Details
Receptors	A telescoping grid of receptors was placed around the project site boundary in the following spacing: 25-meter spacing on the facility boundary; 25-meter spacing from the 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 1,000 meters; and 500-meter spacing from 1,000 meters to 2,000 meters.

Sources: [a] Port of Stockton 2021; [b] EPA 2023b; [c] Nexus 2024.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
See Appendix B3 for additional information.

Health Risk Assessment

The greatest potential for TAC emissions during project construction would be DPM emissions from heavy equipment operations and heavy-duty trucks. During operation, the project would emit DPM from offroad, onroad, and rail sources in addition to TACs from various processes at the plant. As a precautionary measure, an HRA was performed to assess the impact of construction and operation on sensitive receptors proximate to the Tuolumne Facility and along key travel corridors. Complete model results for the HRA are included as Appendix B4. For risk assessment purposes, PM_{10} in diesel exhaust is considered a proxy for DPM.[16] Emissions of TACs during construction were estimated using CalEEMod. During operation, emissions of TACs were estimated using CalEEMod and a spreadsheet model with emission factors from US EPA AP-42 and GAEPD.

The HRA applies the methodologies prescribed in the Office of Environmental Health Hazard Assessment (OEHHA) document, Air Toxics Hot Spots Program Risk Assessment Guidelines – Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015). Cancer risk parameters, such as age-sensitivity factors, daily breathing rates, exposure period, fraction of time at home, and cancer potency factors were based on the values and data recommended by OEHHA are implemented in CARB's Hotspots Analysis and Reporting Program Version 2 (HARP2), which was used to estimate risk from construction activities.

Tuolumne County APCD does not have an established carcinogenic (cancer) risk threshold or health hazard threshold. Therefore, a cancer risk threshold of 10 in one million and a Chronic Hazard Index significance threshold of 1.0 was applied for the Tuolumne Facility impact analysis consistent with the health risk thresholds applied in the Tuolumne County General Plan Update EIR (Tuolumne County 2018).

A dispersion modeling analysis was conducted of TACs emitted from the project to assess the health risk impacts of the construction and operation on proximate existing off-site sensitive receptors.

The dispersion modeling was performed using AERMOD, which is the model Tuolumne County APCD requires for atmospheric dispersion of emissions. AERMOD parameters were selected consistent with the EPA guidance and identified as representative of the project site and project activities Principal parameters of this modeling are presented in Table 3.2-17.

16 Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. The California EPA is a proponent of using the surrogate approach to quantifying cancer risks associated with diesel exhaust over a component-based approach, which involves estimating risks for each of the individual components of a mixture. The California EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components" (OEHHA 2003).

Table 3.2-17. AERMOD Principal Parameters – Tuolumne Health Risk Assessment

Parameter	Details			
Meteorological Data	The latest 5-year meteorological data (2018–2022) for the Modesto Station (Station ID 23258) from the San Joaquin Valley APCD were downloaded and then input to AERMOD.			
Urban versus Rural Option	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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the rural dispersion option was selected due to the predominant land use surrounding the project.			
Terrain Characteristics	The terrain in the vicinity of the modeled project site is generally hilly. The elevation of the modeled site is about 1,107 feet above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.			
Elevation Data	Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey's National Elevation Dataset format with a 30-meter resolution.			
Emission Sources	Emissions from onsite and offsite sources (rail and haul trucks) were modeled within a 4-kilometer grid around the project site.			
Source Release Characterizations - Construction	**Source ID:**	**Source Name:**	**Source Type:**	**Source Parameters:**
	SLINE1	Haul Trucks North[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.491 g/s[1]
	SLINE2	Haul Trucks South[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.509 g/s[1]
	SLINE3	Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
Source Release Characterizations - Operation	**Source ID:**	**Source Name:**	**Source Type:**	**Source Parameters:**
	SLINE1	Haul Trucks North[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.491 g/s[2]
	SLINE2	Haul Trucks South[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.509 g/s[2]
	SLINE3	Rail Travel[a]	Line Volume	Plume Height: 9.7 m Plume Width: 4.05 m Release Height: 4.85 m Emission Rate: 1 g/s

Table 3.2-17. AERMOD Principal Parameters – Tuolumne Health Risk Assessment

Parameter	Details			
	SLINE4	Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.755 g/s^{3}
	SLINE5	Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.065 g/s^{3}
	SLINE6	Dryer Furnace Ash Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.18 g/s^{3}
	VOL6	Dry Chips Storage[c]	Volume	Release Height: 18.288 m Length of Side: 19.72 m Initial Lateral Dimension: 4.59 m Initial Vertical Dimension: 8.51 m Emission Rate: 1 g/s
	STCK1	Dryer[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.93 m Gas Exit Velocity: 18.762 m/s
	STCK2	RTO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 330.0 F Stack Inside Diameter: 1.93 m Gas Exit Velocity: 0.006 m/s
	STCK3	Furnace Abort[c]	Point	Release Height: 26.213 m Emission Rate: 1.0 g/s Gas Exit Temperature: 1,335.0 F Stack Inside Diameter: 1.295 m Gas Exit Velocity: 79.927 m/s
	STCK4	Dry Hammermill[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 2.996 m Gas Exit Velocity: 3.347 m/s
	STCK5	Pellet Mill[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.996 m Gas Exit Velocity: 3.347 m/s
	STCK6	RCO Burners[c]	Point	Release Height: 18.288 m Emission Rate: 1.0 g/s Gas Exit Temperature: 250.0 F Stack Inside Diameter: 2.996 m

Table 3.2-17. AERMOD Principal Parameters – Tuolumne Health Risk Assessment

Parameter	Details			
				Gas Exit Velocity: 0.004 m/s
	STCK7	Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1.0 g/s Gas Exit Temperature: 300.0 F Stack Inside Diameter: 0.101 m Gas Exit Velocity: 45.438 m/s
	STCK8	Rail Idling[a]	Point	Release Height: 4.9 m Emission Rate: 1.0 g/s Gas Exit Temperature: 195.53 F Stack Inside Diameter: 0.6 m Gas Exit Velocity: 3.1 m/s
Receptors	Discrete cartesian receptors were placed on sensitive receptors in close proximity to the project site and haul truck/rail routes.			

Sources: [a] Port of Stockton 2021; [b] EPA 2023b; [c] Nexus 2024.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
1 An emission rate of 1 g/s was divided equally between the number of volume sources within the sources modeled.
2 An emission rate of 1 g/s was divided equally between the number of volume sources within the sources modeled.
3 An emission rate of 1 g/s was divided equally between the number of volume sources within the sources modeled.
See Appendix B4 for additional information.

AERMOD was run with all sources emitting unit emissions (1 gram per second) to obtain the necessary input values for CARB's Hotspots Analysis and Reporting Program Version 2 (HARP2). The line of volume sources was partitioned evenly based on the 1 gram per second emission rate. The ground-level concentration plot files were then used to estimate the long-term cancer health risk to an individual, and the noncancerous chronic health indices.

Dispersion model plotfiles from AERMOD were then imported into CARB's HARP2 to determine health risk, which requires peak 1-hour emission rates and annual emission rates for all pollutants for each modeling source. The exposure duration for the construction emissions was 1.25 years starting in the 3rd trimester of pregnancy. The operational exposure duration was assumed to be 30 years starting in the 3rd trimester of pregnancy. The results from the construction and operational assessment were summed to provide the combined risk results from the project. The risk results were then compared to Tuolumne County APCD thresholds to assess project impact significance.

3.2.4.1.3 Transport to Market (Project-Level)

SDFs are incorporated as enforceable best practices to reduce criteria air pollutant emissions and other environmental impacts, which include SDF-AQ-1 and SDF-AQ-2 as introduced under Section 3.2.4.1.2. SDF-AQ-1 requires all project activities to comply with the applicable air district requirements. SDF-AQ-2 requires the project to implement a construction fugitive dust control plan to reduce project-generated dust.

Rail Transport

Construction

All potential construction emissions associated with the rail transport aspect of the project are included in other parts of the analysis contained herein as follows:

- Rail spur construction at the Lassen Facility is included in the Lassen construction scenario.
- Rail spur construction at the Tuolumne Facility is included in the Tuolumne construction scenario.
- Rail spur construction at the Port of Stockton is included in the Port of Stockton construction scenario.

No additional construction emissions associated with rail transport are anticipated to occur as a result of the project.

Operation

A project-dedicated Class I (line-haul) train ("unit train") would be required to transport pellets from the Lassen Facility and manifest trains[17] would be used for line-haul transport from the Tuolumne Facility. Figure 3.2-2 shows the air districts that the line haul routes go through. Line-haul locomotive emissions were estimated based on anticipated fuel use and locomotive emission factors. Fuel use was estimated based on the number and weight of filled railcars from the Lassen and Tuolumne Facilities to the Port, empty railcars from the Port to the Lassen and Tuolumne Facilities, the number and weight of locomotives needed to transport the railcars, the rail travel distance between the pellet facilities and the Port, and a fuel consumption factor for line-haul locomotives. The average Class I locomotive emission factors (in pounds per gallon of fuel) were based on CARB's *2021 Line-Haul Emission Inventory* (CARB 2021b). The total train travel emissions were then apportioned to each air district based on the length of rail through the air district jurisdictions. Finally, 1-hour of locomotive idling was assumed per train at the Lassen and Tuolumne Facility and Port. Line-haul rail assumptions are provided in Table 3.2-18 below.

Table 3.2-18. Line-Haul Assumptions for Pellet Transport

Parameter	Values	Units	Source/Notes
Lassen Facility			
Annual Pellets Produced	771,618	tons	Project Description (700,000 MT)
Number of Trains per Year	70	trains	Project Description
Cars per Train	100	cars/train	Project Description
Weight of Empty Rail Car	30.25	tons/car	Based on Rail Car Specifications
Weight of Pellets Transported	110.23	tons/car	Project Description (100 MT)
Locomotives per Train	6	locomotive/train	Project Description
Weight of Locomotive	208	tons/locomotive	Based on Trammel Crow Project EIR for Port of Stockton (Trammel Crow DEIR 2022)
Net Aggregated Fuel Consumption Index	868	ton-mile/gal	Based on Trammel Crow Project EIR for Port of Stockton

17 A manifest train moves different types of rail cars carrying freight from multiple shippers. See Chapter 2 ("Project Description") and Chapter 3.14 ("Transportation") for additional information regarding unit and manifest train trip generation.

Table 3.2-18. Line-Haul Assumptions for Pellet Transport

Parameter	Values	Units	Source/Notes
Miles Traveled	296	miles/one-way	Based on GIS data
Trip Rate	7,000	cars/year	70 Trains/Year per Project Description
Locomotive Idling	420	hours/year	70 Trains/Year, each locomotive idling for 1 hour each at facility and Port
Project Fuel Consumption (Inbound)	102,000.65	gal/year	Inbound = Empty Train from Port
Project Fuel Consumption (Outbound)	365,132.95	gal/year	Outbound = Train + Pellets to Port
Project Fuel Consumption (Idling)	2,100.00	gal/year	5 gal/hour; CARB 2016 Technology Assessment Freight Locomotives (CARB 2016)
% Train Travel in Lassen County APCD	26.21%		Based on GIS data
% Train Travel in Northern Sierra AQMD	23.83%		Based on GIS data
% Train Travel in Butte County AQMD	17.10%		Based on GIS data
% Train Travel in Feather River AQMD	13.85%		Based on GIS data
% Train Travel in Sacramento Metropolitan AQMD	11.38%		Based on GIS data
% Train Travel in San Joaquin Valley APCD	9.19%		Based on GIS data
Tuolumne Facility			
Annual Pellets Produced	330,693	tons	Project Description (300,000 MT)
Number of Manifest Trains per Year - Average	240	trains	Project Description (Adding cars to existing manifest trains each day)
Cars per Train - Average	13	cars/train	Project Description
Weight of Empty Rail Car	30.25	tons/car	Based on Rail Car Specifications
Weight of Materials Imported	110.23	tons/car	Project Description (100 MT)
Locomotives per Train	0	additional locomotives/train	It is anticipated that no additional locomotives would be needed for the manifest train to accommodate the project's 13 rail cars.
Weight of Locomotive	208	tons/locomotive	Based on Trammel Crow Project EIR for Port of Stockton
Net Aggregated Fuel Consumption Index	868	ton-mile/gal	Based on Trammel Crow Project EIR for Port of Stockton
Miles Traveled	64	miles/one-way	Based on GIS Maps
Trip Rate	3,000	cars/year	Project Description

Table 3.2-18. Line-Haul Assumptions for Pellet Transport

Parameter	Values	Units	Source/Notes
Locomotive Idling	240	hours/year	240 Trains/Year, 1 hour idling at facility (new stop)
Project Fuel Consumption (Inbound)	6,645.24	gal/year	Inbound = Empty Train from Port
Project Fuel Consumption (Outbound)	30,860.53	gal/year	Outbound = Train + Pellets to Port
Project Fuel Consumption (Idling)	1,200	gal/year	5 gal/hour; CARB 2016 Technology Assessment Freight Locomotives
% Train Travel in Tuolumne County APCD	14.87%		Based on GIS data
% Train Travel in San Joaquin Valley APCD	85.13%		Based on GIS data

Source: Appendix B2.

At the Lassen Facility and the Port, Class III (switcher) trains would be used to provide short transport to the project facilities. As with line-haul described above, switcher emissions were estimated based on fuel use and locomotive emission factors. Fuel use was based on the number, engine tier, running and idling load factors, and horsepower of switcher locomotives at the Port, number of anticipated switching events based on project trains, and average switching time. Switcher locomotive emission factors at the Port were estimated based on switcher emission factors by engine tier provided in CARB's *2017 Short Line/ Class III Documentation* (CARB 2017b) and weighted by the Port's switcher engine tier distribution. For the Lassen facility, similar parameters were assumed for the switcher, except the unmitigated scenario was modeled using a statewide average switcher tier and the mitigated scenario was modeled using Tier 4 engine emission factors for the switcher (per MM-AQ-9). Notably, as the switchers would operate in and around the Lassen Facility or Port of Stockton, all emissions associated with their operations would be within the Lassen County APCD and San Joaquin Valley APCD jurisdiction, respectively. Switcher rail assumptions are provided in Table 3.2-19 and Table 3.2-20 below.

Table 3.2-19. Switcher Assumptions for the Lassen Facility

Parameter	Values	Units	Source/Notes
Unmitigated Scenario – Statewide Average Engine Tier Switcher			
Engine Tier	Pre-Tier		
Engine Horsepower	1,500	hp	Based on Trammel Crow Project EIR for Port of Stockton
Load Factor - Running	0.245	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Load Factor - Idling	0.010	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Fuel Usage - Running	24.14	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)
Fuel Usage - Idling	0.99	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)

Table 3.2-19. Switcher Assumptions for the Lassen Facility

Parameter	Values	Units	Source/Notes
Mitigated Scenario – Tier 4 Engine Switcher			
Engine Tier	Tier 4		
Engine Horsepower	1,500	hp	Based on Trammel Crow Project EIR for Port of Stockton
Load Factor - Running	0.245	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Load Factor - Idling	0.010	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Fuel Usage - Running	17.64	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)
Fuel Usage - Idling	0.72	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)
Average Port Switcher Engine Mode and Operations			
Engines/Train	1	NA	
Daily Operation - Running	1.00	hours/day	Based on Trammel Crow Project EIR for Port of Stockton
Daily Operation - Idling	0.17	hours/day	Based on Trammel Crow Project EIR for Port of Stockton
Annual Operation - For Trains from Lassen Facility	70.00	days/year	Project Description (assuming 1 train/day)

Source: Appendix B2.

Table 3.2-20. Switcher Assumptions for Pellet Transport at the Port

Parameter	Values	Units	Source/Notes
SW1500 Engine			
Engine Tier	Tier 0	NA	Based on Trammel Crow Project EIR for Port of Stockton
Engine Horsepower	1,500	hp	Based on Trammel Crow Project EIR for Port of Stockton
Load Factor - Running	0.245	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Load Factor - Idling	0.010	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Fuel Usage - Running	24.14	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)
Fuel Usage - Idling	0.99	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)
Brookville Genset			
Engine Tier	Tier 4		Based on Trammel Crow Project EIR for Port of Stockton

Table 3.2-20. Switcher Assumptions for Pellet Transport at the Port

Parameter	Values	Units	Source/Notes
Engine Horsepower	1,200	hp	Based on Trammel Crow Project EIR for Port of Stockton
Load Factor - Running	0.245	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Load Factor - Idling	0.010	NA	EPA's Locomotive Emission Standards Regulatory Support Document (EPA 1998b)
Fuel Usage - Running	14.11	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)
Fuel Usage - Idling	0.58	gal/hour	Based on Tier, HP, Load Factor, and CARB's Conversion Factor (CARB 2017b)
Average Port Switcher Engine Mode and Operations			
Engines/Train	1	NA	Based on Trammel Crow Project EIR for Port of Stockton
Average Fuel Use - Running	19.13	gal/hour	Averaged running fuel use for SW1500 and Brookville engines
Average Fuel Use - Idling	0.78	gal/hour	Averaged idling fuel use for SW1500 and Brookville engines
Daily Operation - Running	1.00	hours/day	Based on Trammel Crow Project EIR for Port of Stockton
Daily Operation - Idling	0.17	hours/day	Based on Trammel Crow Project EIR for Port of Stockton
Annual Operation - For Trains from Lassen Facility	70.00	days/year	Project Description (assuming 1 train/day)
Annual Operation - For Trains from Tuolumne Facility	240.00	days/year	Project Description (assuming 1 train/day)

Source: Appendix B2.

Port of Stockton

Construction Mass Emissions

For purposes of estimating project emissions, and based on information provided by the project applicant, it is assumed that construction at the Port of Stockton would commence in October 2024 and would last approximately 15 months, ending in December 2025.[18] Table 3.2-21 presents the construction scenario assumptions used for estimating construction emissions of the Port of Stockton in CalEEMod. The construction schedule and equipment load has been developed based on available information provided by the project Applicant, typical construction practices, and CalEEMod default assumptions.

18 The analysis assumes a construction start date of October 2024, which represents the earliest date construction was anticipated to potentially initiate at the time the analysis was performed. Assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutant and GHG emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

Construction of the Port of Stockton facilities would generate criteria air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, and asphalt pavement application. It was assumed that 2,000 tons of debris would be removed during the demolition phase to account for the existing parking lot. As the Port has been previously graded, no import or export of material is anticipated to be required. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Construction of project components would be subject to San Joaquin Valley APCD Rule 8201, Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities. Compliance with Rule 8201 would limit fugitive dust (PM_{10} and $PM_{2.5}$) that may be generated during grading and construction activities. SDF-AQ-2 would implement a dust control plan that would further reduce fugitive dust emissions.

The worker vehicles, vendor trucks, and haul trucks trip distances were based on CalEEMod defaults, which is a reasonable representation of actual conditions based upon the location and characteristics of this project site and construction activities.

Table 3.2-21. Port of Stockton Construction Scenario Assumptions

Construction Phase	Start Date	Finish Date	One-Way Vehicle Trips			Equipment		
			Average Daily Workers	Average Daily Vendor Trucks	Average Daily Haul Trucks	Type	Quantity	Usage Hours
Demolition	10/1/2024	10/31/2024	18	4	0	Concrete/ Industrial Saws	1	8
						Crawler Tractors	1	8
						Excavators	3	8
						Rubber Tired Loaders	2	8
Site Preparation	11/1/2024	11/30/2024	18	4	0	Rubber Tired Dozers	3	8
						Tractors/ Loaders/ Backhoes	4	8
Grading (Including Utilities)	12/1/2024	12/31/2024	16	4	0	Excavators	1	8
						Graders	1	8
						Rubber Tired Dozers	1	8
						Tractors/ Loaders/ Backhoes	3	8
Building/ Vertical Construction	1/1/2025	11/30/2025	32	12	0	Cranes	8	7
						Forklifts	6	8
						Generator Sets	8	8
						Tractors/ Loaders/ Backhoes	3	7

Table 3.2-21. Port of Stockton Construction Scenario Assumptions

Construction Phase	Start Date	Finish Date	One-Way Vehicle Trips			Equipment		
			Average Daily Workers	Average Daily Vendor Trucks	Average Daily Haul Trucks	Type	Quantity	Usage Hours
						Welders	20	8
Rail Spurs Construction	1/1/2025	9/1/2025	10	4	0	Excavators	1	8
						Rubber Tired Dozers	1	8
						Tractors/ Loaders/ Backhoes	1	8
						Rail Tampers[1]	1	8
Paving	1/1/2025	3/1/2025	16	4	0	Pavers	2	8
						Paving Equipment	2	8
						Rollers	2	8
Architectural Coating	11/1/2025	11/30/2025	14	4	0	Air Compressors	1	6

Notes: See Appendix B1 for additional details.
1 Rail Tamper modeled as Other Construction Equipment in CalEEMod at 280 hp.

Operational Mass Emissions

Project operational activities would potentially generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from area sources, energy sources, mobile sources, off-road equipment, and permitted sources, which are discussed below. Emissions from the operational phase of the project were estimated using a combination of CalEEMod Version 2022.1.1.25 and a spreadsheet model based on industry standard emission factors and project-specific information. Operational year 2025 was assumed.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use and the reapplication of architectural coatings.

The description of the consumer products and the reapplication of architectural coating provided for the Lassen Facility operational area sources are the same for the Port of Stockton. Default CalEEMod values were applied for consumer products and the reapplication of architectural coating based on the land use inputs for the project.

Energy Sources

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

Electricity consumption was provided by the project applicant and estimated to be 12,060,000 kWh per year. It was assumed that there would be no natural gas consumption at the Port of Stockton facility.

Mobile Sources

Mobile sources for the Port of Stockton facility would be employees and vendor trucks traveling to and from the Port. Operations at the facility would occur 7 days per week. As described in the Project Description, the facility would require 8 daily GSNR employees over three shifts, and an additional 8 full-time equivalent stevedores for ship loading, resulting in 32 daily one-way trips[19]. It was conservatively assumed that there would be 2 vendor trucks per day to deliver materials and perform intermittent maintenance, resulting in 4 daily one-way trips.

Project-related traffic was assumed to include a mixture of vehicles in accordance with the associated use, as modeled within CalEEMod, which is based on the CARB EMFAC2021 model. Emission factors representing the vehicle mix and emissions for 2025 were used to estimate emissions associated with vehicular sources. Worker and vendor truck trip distances were based on CalEEMod defaults, which is a reasonable representation of actual conditions based upon the location and characteristics of this project site and operational activities. The fleet mix was adjusted in CalEEMod based on the daily trips of the vehicle categories described above.

The methodology for calculating emissions association with train transportation is described in the Rail Transport section above.

Off-Road Equipment

The use of 1 yard truck and 1 tractor/loader/backhoe were assumed to operate at the facility. The yard truck was modeled as a rough terrain forklift at 200 horsepower. CalEEMod was used to estimate criteria air pollutant emissions of the off-road equipment assuming 24 hours of operation per day for 100 days per year, based upon anticipated facility operations. The operational off-road equipment information was provided by the applicant.

Other Facility Emissions

Pellet Storage

The storage and loadout of pellets will generator PM emissions at several points at the POS. PM emissions were estimated using the pellet storage annual throughput of 1,025,149 STPY and emission factors from the baghouse vendor.

Fire Pump

The project includes two diesel fire pumps for use in case there is a fire. The fire pumps are rated at 50 horsepower and are assumed to operate up to 100 hours per year for maintenance and testing. Emissions of criteria air pollutants and TACs were estimated using emission factors from the US EPA AP-42 Section 3.3, *Gasoline and Diesel Industrial Engines*, Table 3.3-1 and 3.3-2 (EPA 1996a).

19 As the Port of Stockton is a fully operational port, and given that the project's demand for stevedoring services is intermittent, it is anticipated that the 8 full-time equivalent stevedores required by the project would be filled by the large existing workforce at and around the Port. As such, the emissions associated with these stevedores' commute trips would be included in the existing workforce baseline and their emissions would be negligible, and thus only the 8 additional GSNR employees have been modeled as new trips for purposes of this analysis.

Ship Transport

The project would receive pellets via railcar to the Port facility where they would be stored in domes. Once the domes are at sufficient quantity (approximately 35,000 MT), a cargo ship would be loaded for transport to end-markets. The emissions from the cargo ship and tugboats were estimated using a spreadsheet model and emission factors from the Port of Stockton 2020 Inventory of Air Emissions (Port of Stockton 2023b). As the exact vessel is not known, weighted emission factors were developed based on the Port's inventory of cargo ships and engine tier distribution. The vessel type was assumed to be of the handymax class. Load factors were calculated for travel during maneuvering, within the bay, and outside of the bay based on the Propeller Law. Ship emissions are quantified within a 100 nautical mile zone of the Port, as recommended in 2011 CARB Emissions Estimation Methodology for Ocean-Going Vessels (CARB 2011). Ships will travel from the Port, through San Joaquin Valley APCD, through BAAQMD, and into the Pacific Ocean beyond the Golden Gate Bridge. Emissions estimates have been grouped by activity, including hoteling, maneuvering, and transit. Transit emissions are split out based on the air district in which emissions occur.

Loadout of the wood pellets into the ships would generate PM emissions as well. Loadout emissions were estimated using the daily and annual throughput and emission factors from US EPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (EPA 2006) and were included in the "Ships" category.

Operational Ambient Air Quality Analysis

In accordance with the SJVAPD *Guidance for Assessing and Mitigating Air Quality Impacts*, when on-site project emissions exceed 100 pounds per day and ambient air quality assessment is required (San Joaquin Valley APCD 2015a). An ambient air quality analysis was performed to assess the project's potential impact on the SJVAB meeting the CAAQS and NAAQS during operation. The San Joaquin Valley Air Pollution Control District APR-1925 was followed as discussed below (San Joaquin Valley APCD 2019). Principal parameters of this Level 1 modeling are presented in Table 3.2-22. Complete model results for the AAQA are included as Appendix B3.

Table 3.2-22. AERMOD Principal Parameters – Port of Stockton Air Quality Impact Assessment

Parameter	Details
Meteorological Data	The latest 5-year meteorological data (2018–2022) for the Stockton Station (Station ID 23237) from the San Joaquin Valley APCD were downloaded and then input to AERMOD.
Urban versus Rural Option	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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the urban dispersion option was selected due to the predominant land use surrounding the project.
Terrain Characteristics	The terrain in the vicinity of the modeled project site is generally hilly. The elevation of the modeled site is at sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.
Elevation Data	Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey's National Elevation Dataset format with a 30-meter resolution.
Emission Sources	Only onsite operational emissions were modeled for this assessment to determine the highest offsite concentration. For emission sources that extend offsite (rail and haul

Table 3.2-22. AERMOD Principal Parameters – Port of Stockton Air Quality Impact Assessment

<table>
<tr><th>Parameter</th><th colspan="4">Details</th></tr>
<tr><td></td><td colspan="4">trucks), the length of the source was limited to within the project boundary. Emissions were modeled using line-volume and point sources within AERMOD.</td></tr>
<tr><td rowspan="10">Source Release Characterizations</td><td>Source ID:</td><td>Source Name:</td><td>Source Type:</td><td>Source Parameters:</td></tr>
<tr><td>SLINE1</td><td>Rail Travel[a]</td><td>Line Volume</td><td>Plume Height: 9.7 m
Plume Width: 4.05 m
Release Height: 4.85 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE2</td><td>Ship Manuevering[a]</td><td>Line Volume</td><td>Plume Height: 59.1 m
Plume Width: 32 m
Release Height: 29.55 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE3</td><td>Yard Trucks[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>SLINE4</td><td>Front End Loader[b]</td><td>Line Volume</td><td>Plume Height: 6.8 m
Plume Width: 8.6 m
Release Height: 3.4 m
Emission Rate: 1 g/s</td></tr>
<tr><td>STCK1</td><td>Ship Hoteling[a]</td><td>Point</td><td>Release Height: 39.9 m
Emission Rate: 1 g/s
Gas Exit Temperature: 546.53 F
Stack Inside Diameter: 0.5 m
Gas Exit Velocity: 18.2 m/s</td></tr>
<tr><td>STCK2</td><td>Pellet Storage[c]</td><td>Point</td><td>Release Height: 7.62 m
Emission Rate: 1 g/s
Gas Exit Temperature: ambient
Stack Inside Diameter: 0.347 m
Gas Exit Velocity: 16.708 m/s</td></tr>
<tr><td>STCK3</td><td>Pellet Storage[c]</td><td>Point</td><td>Release Height: 7.62 m
Emission Rate: 1 g/s
Gas Exit Temperature: ambient
Stack Inside Diameter: 0.347 m
Gas Exit Velocity: 16.708 m/s</td></tr>
<tr><td>STCK4</td><td>Pellet Storage[c]</td><td>Point</td><td>Release Height: 7.62 m
Emission Rate: 1 g/s
Gas Exit Temperature: ambient
Stack Inside Diameter: 0.347 m
Gas Exit Velocity: 16.708 m/s</td></tr>
<tr><td>STCK5</td><td>Pellet Storage[c]</td><td>Point</td><td>Release Height: 7.62 m
Emission Rate: 1 g/s
Gas Exit Temperature: ambient
Stack Inside Diameter: 0.347 m
Gas Exit Velocity: 16.708 m/s</td></tr>
</table>

Table 3.2-22. AERMOD Principal Parameters – Port of Stockton Air Quality Impact Assessment

Parameter	Details			
	STCK6	Pellet Storage[c]	Point	Release Height: 7.62 m Emission Rate: 1 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 0.347 m Gas Exit Velocity: 16.708 m/s
	STCK7	Pellet Storage[c]	Point	Release Height: 7.62 m Emission Rate: 1 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 0.347 m Gas Exit Velocity: 16.708 m/s
	STCK8	Pellet Storage[c]	Point	Release Height: 7.62 m Emission Rate: 1 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 0.347 m Gas Exit Velocity: 16.708 m/s
	STCK9	Diesel Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 0.347 m Gas Exit Velocity: 16.708 m/s
	STCK10	Diesel Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 0.347 m Gas Exit Velocity: 16.708 m/s
	STCK11	Rail Idling[c]	Point	Release Height: 4.9 m Emission Rate: 1 g/s Gas Exit Temperature: 195.53 Stack Inside Diameter: 0.6 m Gas Exit Velocity: 3.1 m/s
Receptors	A telescoping grid of receptors was placed around the project site boundary in the following spacing: 25-meter spacing on the facility boundary; 25-meter spacing from the 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 1,000 meters; and 500-meter spacing from 1,000 meters to 2,000 meters.			

Sources: [a] Port of Stockton 2021; [b] EPA 2023b; [c] Nexus 2024.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
See Appendix B3 for additional information.

Health Risk Assessment

The greatest potential for TAC emissions during project construction would be DPM emissions from heavy equipment operations and heavy-duty trucks. During operation, the project would emit DPM from offroad, marine, and rail sources. As a precautionary measure, an HRA was performed to assess the impact of construction and operation on sensitive receptors proximate to the Port and along key travel corridors. Complete model results for the HRA are included as Appendix B4. For risk assessment purposes, PM_{10} in diesel exhaust is considered a proxy for DPM.[20] Emissions of TACs during construction were estimated using CalEEMod. During operation, emissions of TACs were estimated using CalEEMod and a spreadsheet model with emission factors from the US EPA AP-42 and Port of Stockton 2020 Inventory of Air Emissions (Port of Stockton 2023b).

The HRA applies the methodologies prescribed in the Office of Environmental Health Hazard Assessment (OEHHA) document, Air Toxics Hot Spots Program Risk Assessment Guidelines – Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015). Cancer risk parameters, such as age-sensitivity factors, daily breathing rates, exposure period, fraction of time at home, and cancer potency factors were based on the values and data recommended by OEHHA are implemented in CARB's Hotspots Analysis and Reporting Program Version 2 (HARP2), which was used to estimate risk from construction activities.

The San Joaquin Valley APCD recommends a carcinogenic (cancer) risk threshold of 20 in one million and a Chronic Hazard Index significance threshold of 1.0 (San Joaquin Valley APCD 2015a).

A dispersion modeling analysis was conducted of TACs emitted from the project to assess the health risk impacts of the construction and operation on proximate existing off-site sensitive receptors.

The dispersion modeling was performed using AERMOD, which is the model San Joaquin Valley APCD requires for atmospheric dispersion of emissions. The dispersion modeling included the use of standard regulatory default options. AERMOD parameters were selected consistent with the EPA guidance and identified as representative of the project site and project activities Principal parameters of this modeling are presented in Table 3.2-23.

Table 3.2-23. AERMOD Principal Parameters – Port of Stockton Health Risk Assessment

Parameter	Details
Meteorological Data	The latest 5-year meteorological data (2018–2022) for the Stockton Station (Station ID 23237) from the San Joaquin Valley APCD were downloaded and then input to AERMOD.
Urban versus Rural Option	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, based on the Auer method specified in 40 CFR Part 51 Appendix W, the urban dispersion option was selected due to the predominant land use surrounding the project.
Terrain Characteristics	The terrain in the vicinity of the modeled project site is generally hilly. The elevation of the modeled site is at sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.
Elevation Data	Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey's National Elevation Dataset format with a 30-meter resolution.
Emission Sources	Emissions from onsite and offsite sources (rail and marine vessels) were modeled within a 30-kilometer grid around the project site.

[20] Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. The California EPA is a proponent of using the surrogate approach to quantifying cancer risks associated with diesel exhaust over a component-based approach, which involves estimating risks for each of the individual components of a mixture. The California EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components" (OEHHA 2003).

Table 3.2-23. AERMOD Principal Parameters – Port of Stockton Health Risk Assessment

Parameter	Details			
	Source ID:	Source Name:	Source Type:	Source Parameters:
Source Release Characterizations – Construction	SLINE1	Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.945 g/s[1]
	SLINE2	Offroad Equipment[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 0.0554 g/s[1]
	SLINE3	Haul Trucks[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
Source Release Characterizations – Operation	SLINE3	Lassen Rail[a]	Line Volume	Plume Height: 9.7 m Plume Width: 4.05 m Release Height: 4.85 m Emission Rate: 1 g/s
	SLINE4	Tuolumne Rail[a]	Line Volume	Plume Height: 9.7 m Plume Width: 4.05 m Release Height: 4.85 m Emission Rate: 1 g/s
	SLINE5	Ship Travel[b]	Line Volume	Plume Height: 59.1 m Plume Width: 32.0 m Release Height: 29.55 m Emission Rate: 1 g/s
	SLINE23	Yard Trucks[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	SLINE24	Front End Loader[b]	Line Volume	Plume Height: 6.8 m Plume Width: 8.6 m Release Height: 3.4 m Emission Rate: 1 g/s
	STCK1	Ship Hoteling[a]	Point	Release Height: 39.9 m Emission Rate: 1 g/s Gas Exit Temperature: 546.53 F Stack Inside Diameter: 0.5 m Gas Exit Velocity: 18.2 m/s
	STCK9	Diesel Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 0.347 m Gas Exit Velocity: 16.708 m/s

Table 3.2-23. AERMOD Principal Parameters – Port of Stockton Health Risk Assessment

Parameter	Details			
	STCK10	Diesel Fire Pump[c]	Point	Release Height: 3.658 m Emission Rate: 1 g/s Gas Exit Temperature: ambient Stack Inside Diameter: 0.347 m Gas Exit Velocity: 16.708 m/s
	STCK11	Rail Idling[c]	Point	Release Height: 4.9 m Emission Rate: 1 g/s Gas Exit Temperature: 195.53 Stack Inside Diameter: 0.6 m Gas Exit Velocity: 3.1 m/s
Receptors	Discrete cartesian receptors were placed on sensitive receptors in close proximity to the project site and marine vessel/rail routes.			

Sources: [a] Port of Stockton 2021; [b] EPA 2023b; [c] Nexus 2024.
Notes: g/s = grams per second; ID = Identification; F = degrees Fahrenheit; m = meters.
1 An emission rate of 1 g/s was divided equally between the number of volume sources within the sources modeled.
See Appendix B4 for additional information.

AERMOD was run with all sources emitting unit emissions (1 gram per second) to obtain the necessary input values for CARB's Hotspots Analysis and Reporting Program Version 2 (HARP2). The line of volume sources was partitioned evenly based on the 1 gram per second emission rate. The ground-level concentration plot files were then used to estimate the long-term cancer health risk to an individual, and the noncancerous chronic health indices.

Dispersion model plotfiles from AERMOD were then imported into CARB's HARP2 to determine health risk, which requires peak 1-hour emission rates and annual emission rates for all pollutants for each modeling source. The exposure duration for the construction emissions was 1.17 years starting in the 3rd trimester of pregnancy. The operational exposure duration was assumed to be 70 years starting in the 3rd trimester of pregnancy. The results from the construction and operational assessment were summed to provide the combined risk results from the project. The risk results were then compared to San Joaquin Valley APCD thresholds to assess project impact significance.

3.2.4.2 Project Impacts

Impact AQ-1 The project would potentially conflict with or obstruct implementation of the applicable air quality plan.

An area is designated as in attainment when it complies with the federal and/or state standards. These standards are set by EPA or CARB for the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable effects on human health or public welfare, with a margin of safety.

As recommended by California air districts, there are two general ways to determine the potential for a project to conflict with the applicable air quality plan(s): (1) consistency with the underlying land use designations (e.g., General Plan designation), and (2) potential to exceed numeric thresholds established to determine if a project would result in a significant air quality impact.

Feedstock Acquisition

Sustainable Forest Management Projects

Sustainable Forest Management Projects would not result in a land use zoning change and would be consistent with the underlying land use designations. These projects take place in the Lassen and Tuolumne feedstock Working Areas which cover multiple air basins and air district jurisdictions. Feedstock acquisition would increase employment in the general region, but this employment would not be substantial in any given location give the scale of the Sustainable Forest Management Projects area and the distribution of crews. As such, the project would not result in substantial population or employment growth exceeding estimates found in applicable plans.

However, as shown in Tables 3.2-24, 3.2-25, 3.2-28, and 3.2-29, feedstock acquisition in the Lassen feedstock area and the Tuolumne Feedstock area, if each were undertaken simultaneously within any one air district, would have the potential to exceed air district thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$ with implementation of PDF-AQ-1 (Air District Regulatory Compliance – Feedstock Acquisition) and PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) and prior to mitigation, and the impact would be **potentially significant.** After implementation of **MM-AQ-1** through **MM-AQ-4**, which implement Tier 4 Final engines in offroad equipment, limit truck and offroad equipment idling, incorporate renewable diesel fuel in trucks and offroad equipment, and educate workers to optimize their commutes, and as shown in Tables 3.2-26, 3.2-27, 3.2-30, 3.2-31, the emissions during feedstock acquisition would still exceed daily and annual air district thresholds for NO_X, CO, PM_{10}, and $PM_{2.5}$. Therefore, the project would conflict with the applicable air quality plans and the impact related to this portion of the project would be **significant and unavoidable.**

Wood Pellet Production

Lassen Facility

The proposed Lassen Facility would result in the construction of a wood pellet production facility on a previously partially developed site. The Lassen Facility site is located on a portion of a larger property that included a mill site (which is not part of the proposed facility) and an area used by the mill operators and others to load rail cars.

The northern parcel of the Lassen Facility site, where the production facility is located, is designated as Town Center by the County General Plan. Town Center designations are applied to central areas of small unincorporated areas in the County and generally serve as the commercial and social centers of the surrounding communities, containing a mixture of commercial and residential uses. The corresponding zoning of the northern parcel is A-1, General Agriculture. According to the County Municipal Code Chapter 18.16, the intent of A-1 is to be applied to unincorporated territory of the County where precise zoning is not required. The County determined that the general character of the county is agriculture, thus, A-1 is applied to areas not indicated specifically to be used for precise districts of agriculture, residential, commercial, manufacturing, open space, institutional, conservation, timber production, floodplain, or airport. The zoning allows for a variety of agricultural industrial uses, with approval of a conditional use permit, including sawmills.

A portion of the southern parcels of the Lassen Facility site, designated as Intensive Agriculture by the General Plan, would be used for feedstock storage (e.g., log decking). Intensive Agriculture identifies lands devoted to or having a high suitability potential for crop growing and/or the raising of livestock on improved or natural pastureland. The southerly parcels are zoned Exclusive Agricultural, Agricultural Preserve Combining District (E-A-A-P), consistent with the Intensive Agriculture planning designation. The E-A-A-P allows for storage of agricultural products, including timber. As the production facilities would not be located on this parcel, the log decking would be allowed under the zoning designation. Therefore, the proposed Lassen Facility would be consistent with the underlying land use designations.

As discussed in below Impact AQ-2 and as shown in Table 3.2-32, emissions from criteria pollutants during construction would have the potential to exceed the Lassen County APCD daily BACT thresholds with implementation of SDF-AQ-1 and SDF-AQ-2 and prior to mitigation. As shown in Table 3.2-38, operational emissions at the Lassen Facility would have the potential to exceed daily BACT thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$ prior to mitigation, and the impact would be **potentially significant.** After implementation **MM-AQ-2** through **MM-AQ-7**, and as shown in Table 3.2-34, construction emissions would not exceed Lassen County APCD daily BACT thresholds, and the impact related to that aspect of the project would be less than significant. However, after implementation of **MM-AQ-2** through **MM-AQ-4**, **MM-AQ-8**, and **MM-AQ-9**, and as shown in Table 3.2-40, the operational emissions at the Lassen Facility would still exceed daily BACT thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$. Therefore, the project would conflict with the Lassen County APCD air quality plans and the impact related to this portion of the project would be **significant and unavoidable.** The site design features and mitigation measures described above and implemented at the Lassen Facility are as follows:

- **SDF-AQ-1: Air District Regulatory Compliance –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **SDF-AQ-2: Construction Fugitive Dust Control Plans –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-2: Construction and Operation Limit Truck and Equipment Idling –** Feedstock Acquisition, Lassen Facility, and Tuolumne Facility
- **MM-AQ-3: Construction and Operation Renewable Diesel Fuel –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-4: Construction and Operational Worker Commute Optimization –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-5: Construction Equipment Exhaust Minimization –** Tier 4 Final – Lassen Facility
- **MM-AQ-6: Construction Lower-VOC Paints –** Lassen Facility
- **MM-AQ-7: Construction Activities Notification –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-8: Operational Equipment Exhaust Minimization –** Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-9: Operational Switcher Locomotive Exhaust Minimization –** Lassen Facility

Tuolumne Facility

The proposed Tuolumne Facility would result in the construction of a wood pellet production facility on a previously developed site used as wood processing facility. The Tuolumne Facility is designated as Heavy Industrial uses by the County General Plan. This designation allows for several uses including all types of manufacturing and processing activities.

The Tuolumne Facility is also zoned as M-2, or Heavy Industrial by the County. According to Chapter 17.40 of the Tuolumne County Ordinance Code, this zoning allows for several uses including general manufacturing, sawmills, processing, and refining as a permitted land use. As an agricultural industrial use, similar to a sawmill, the proposed facility is allowed under the existing zoning, and would require only a Site Development Permit approval, in accordance with Chapter 17.68 of the Tuolumne County Ordinance Code. Therefore, the proposed Tuolumne Facility would be consistent with the underlying land use designations.

As discussed in Impact AQ-2, emissions from criteria pollutants during construction would not exceed the Tuolumne County APCD significance thresholds with implementation of SDF-AQ-1 and SDF-AQ-2 (Tables 3.2-44 and 3.2-45). However, as shown in Table 3.2-49, operational emissions at the Tuolumne Facility would have the potential to exceed the annual threshold for CO and prior to mitigation, and the impact would be **potentially significant.** After implementation of **MM-AQ-2** through **MM-AQ-4**, **MM-AQ-7** through **MM-AQ-8**, and **MM-AQ-10**, and as shown in Table 3.2-50, the operational emissions at the Tuolumne Facility would still exceed the annual threshold for CO. Therefore, the project would conflict with the Tuolumne County APCD air quality plans and the impact would be **significant and unavoidable.** The site design features and mitigation measures described above and implemented at the Tuolumne Facility are as follows:

- **SDF-AQ-1: Air District Regulatory Compliance –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **SDF-AQ-2: Construction Fugitive Dust Control Plans –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-2: Construction and Operation Limit Truck and Equipment Idling –** Feedstock Acquisition, Lassen Facility, and Tuolumne Facility
- **MM-AQ-3: Construction and Operation Renewable Diesel Fuel –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-4: Construction and Operational Worker Commute Optimization –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-7: Construction Activities Notification –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-8: Operational Equipment Exhaust Minimization –** Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-10: Construction Equipment Exhaust Minimization –** Tier 4 Final –Tuolumne Facility

Transport to Market

Rail Transport

There are no land use changes associated with the line-haul rail transport of the project. However, as shown in Tables 3.2-53 and 3.2-54, line-haul rail transport emissions would exceed the Northern Sierra AQMD, Butte County AQMD, Feather River AQMD, and Sacramento Metropolitan AQMD daily thresholds for NO_X, and the Butte County AQMD and Feather River AQMD annual thresholds for NO_X. Therefore, the project would conflict with the applicable air quality plans, resulting in a **potentially significant impact.** The impact related to this portion of the project is **significant and unavoidable** because no feasible mitigation exists to reduce impacts below a level of significance, as discussed under Impact AQ-2.

Port of Stockton

The proposed Port of Stockton facility would result in the construction of project specific features and the use of an existing Port of Stockton Berth. The Port of Stockton site is located in the Port of Stockton West Complex, which has historically been used for port related activities, including warehousing. The Port of Stockton site is designated as Institutional use by the City's General Plan and zoned as Port district. The Port is zoned as such, which allows for the operation of port facilities including dockage, wharves, and warehousing. Therefore, the proposed Port of Stockton facility would be consistent with the underlying land use designations.

A project is non-conforming with an air quality plan if it conflicts with or delays implementation of any applicable attainment or maintenance plan. The San Joaquin Valley APCD 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 Act, as detailed in the Regulatory Section above. The San Joaquin Valley APCD has established thresholds of significance for criteria pollutant emissions, which are based on San Joaquin Valley APCD New Source Review offset requirements for stationary sources. Stationary sources in the San Joaquin Valley APCD jurisdiction are subject to some of the most stringent regulatory requirements in the nation. Emission reductions achieved through implementation of San Joaquin Valley APCD offset requirements are a major component of the San Joaquin Valley APCD's air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to not conflict or obstruct implementation of the San Joaquin Valley APCD's air quality plan (San Joaquin Valley APCD 2015a).

As discussed in Impact AQ-2, emissions from criteria pollutants during construction would not exceed the San Joaquin Valley APCD significance thresholds with implementation of SDF-AQ-1 and SDF-AQ-2 (Table 3.2-55). However, Port of Stockton facility operations would result in a net increase in emissions and, as shown in Table 3.2-57, the increase in emissions would exceed the San Joaquin Valley APCD annual NO_X significance threshold prior to mitigation, and the impact would be **potentially significant.** After implementation of **MM-AQ-2** through **MM-AQ-4**, **MM-AQ-7**, **MM-AQ-8** and **MM-AQ-11**, the operational emissions caused by the Port of Stockton facility would still exceed numeric thresholds for NO_X (Table 3.2-59). Therefore, the project would conflict with the San Joaquin Valley APCD's air quality plans and the impact would be **significant and unavoidable.** The mitigation measures described above and implemented during operation at the Port of Stockton are as follows:

- **SDF-AQ-1: Air District Regulatory Compliance –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **SDF-AQ-2: Construction Fugitive Dust Control Plans –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-2: Construction and Operation Limit Truck and Equipment Idling –** Feedstock Acquisition, Lassen Facility, and Tuolumne Facility
- **MM-AQ-3: Construction and Operation Renewable Diesel Fuel –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-4: Construction and Operational Worker Commute Optimization –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-7: Construction Activities Notification –** Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-8: Operational Equipment Exhaust Minimization –** Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-11: Operational Switcher Exhaust Minimization –** Port of Stockton

Similar to Impact AQ-2 (discussed in greater detail below), this impact is reflective of project-related emissions occurring within the entire San Joaquin Valley APCD, a significant portion of which (such as the majority of rail transport emissions) may not be experienced in the immediate vicinity of the Port of Stockton. This does not affect the final impact conclusion, but is noted here for informational purposes to help the public evaluate the effects of the project for the Stockton community.

Ship Transport – Bay Area AQMD[21]

There are no land use changes associated with the ship transport of the project. As shown in Table 3.2-68, emissions from ship transport within the Bay Area AQMD jurisdiction would exceed the Bay Area AQMD daily and annual threshold for NO_X. Therefore, the project would conflict with the applicable air quality plans, resulting in a **potentially significant impact**. The impact related to this portion of the project is **significant and unavoidable** because no feasible mitigation exists to reduce impacts below a level of significance, as discussed under Impact AQ-2.

Conclusion

Because activities implemented under the project would generate levels of criteria air pollutants and precursors that are anticipated to exceed air district thresholds, these emissions could result in, or contribute to, exceedances of the NAAQS and CAAQS for criteria air pollutants (specifically VOC and NO_x that contribute to ozone, CO, PM_{10}, and $PM_{2.5}$), thereby potentially conflicting with the air quality planning efforts of regional air districts (including but not limited to Lassen County APCD, Tuolumne County APCD, and San Joaquin Valley APCD), including those that comprise the SIP. With implementation of the mitigation measures described herein, there remain emissions in excess of the applicable thresholds of significance. As such, impacts associated with the potential for the project to conflict with or obstruct implementation of the applicable air quality plan are **significant and unavoidable.**

Impact AQ-2 The project would potentially result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

Feedstock Acquisition

Sustainable Forest Management Projects

Feedstock acquisition would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources (worker vehicles, vendor trucks [i.e. water trucks], and haul trucks) and off-road equipment. Emissions would also be generated by entrained dust, which results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil. The first year of operation was assumed to be 2025, which is a conservative assumption, as noted above.

The maximum daily and annual thresholds for each respective air district that the Lassen and Tuolumne feedstock areas have the potential to occur within are provided in Tables 3.2-24 through 3.2-31, below. “Summer” emissions are representative of the project operations anticipated to occur during the O_3 season (May 1 to October 31), and “winter” emissions are representative of the project operations anticipated to occur during the balance of the year (November 1 to April 30). The emissions associated with feedstock acquisition would be compared to the most stringent daily and annual thresholds for each criteria air pollutant. This comparison is anticipated to be conservative because it was assumed that all operations would take place in one air district, which is unlikely in practice. (More precise specification of the percentage of crews operating in any given air district at any given time is impracticable at the program-level, as individual Sustainable Forest Management Project locations and timing have not yet been determined.)

21 As noted under Impact AQ-2, emissions from ship transport within the San Joaquin APCD are included in the analysis of the Port of Stockton facility.

As described in Section 3.2.4.1.1, the project would implement PDF-AQ-1 (Air District Regulatory Compliance – Feedback Acquisition) and PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) during feedstock acquisition, which would require air district regulatory compliance and fugitive dust control. PDF-AQ-2, which specifically limits vehicle speed on unpaved roads, would be quantified in the analysis to reduce fugitive dust emissions. PDF-AQ-2 also requires watering where feasible, but the fugitive dust emissions reductions associated with watering were not quantified. Watering unpaved roads and exposed areas twice per day would reduce fugitive dust emissions by up to 55%, but this reduction was not quantified because watering feasibility will depend on each site condition.

Details of the emission calculations are provided in Appendix B1.

Lassen Feedstock Area

Table 3.2-24 presents the unmitigated maximum daily criteria air pollutant emissions for the Lassen feedstock area compared to the most stringent air district daily threshold. “Summer” emissions are representative of the project operations anticipated to occur during the O_3 season (May 1 to October 31), and “winter” emissions are representative of the project operations anticipated to occur during the balance of the year (November 1 to April 30).

Table 3.2-24. Estimated Maximum Daily Criteria Air Pollutant Emissions – Lassen Feedstock Area – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025 and Subsequent[22]	79.96	1,120.34	607.20	2.69	1,879.16	345.15
Winter						
2025 and Subsequent	79.76	1,130.07	596.08	2.69	1,879.16	345.15
Maximum Daily Emissions	**79.96**	**1,130.07**	**607.20**	**2.69**	**1,879.16**	**345.15**
Butte County AQMD Threshold	137	137	N/A	N/A	150	150
Lassen County APCD Threshold	150	150	550	150	150	150
Northern Sierra AQMD Threshold	136	136	N/A	N/A	136	N/A
Shasta County AQMD Threshold	137	137	N/A	N/A	137	N/A
Tehama County APCD Threshold	137	137	N/A	N/A	137	N/A
Most Stringent Threshold	*136*	*136*	*550*	*150*	*136*	*150*
Most Stringent Threshold Exceeded?	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition)Air districts in which feedstock activities may occur but that have not established any applicable daily thresholds are not listed.

22 The analysis assumes an operational year of 2025, which represents the earliest year feedstock operations could initiate. Assuming the earliest start date for operations represents the worst-case scenario for criteria air pollutant emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

As shown in Table 3.2-24, the sustainable forest management projects in the Lassen feedstock area, if undertaken simultaneously within any one air district, would exceed the most stringent applicable air district daily thresholds for NO_X, CO, PM_{10}, and $PM_{2.5}$ prior to mitigation. This impact would be **potentially significant** prior to mitigation.

Table 3.2-25 presents the unmitigated annual criteria air pollutant emissions for the Lassen feedstock area compared to Butte County AQMD's annual thresholds, which is the only air district within the Lassen Working Area with applicable annual thresholds.

Table 3.2-25. Estimated Annual Criteria Air Pollutant Emissions – Lassen Feedstock Area – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2025 and Subsequent	6.98	98.84	52.35	0.24	148.87	28.64
Total Annual Emissions	**6.98**	**98.84**	**52.35**	**0.24**	**148.87**	**28.64**
Butte County AQMD Threshold	4.5	4.5	N/A	N/A	N/A	N/A
Most Stringent Threshold Exceeded?	**Yes**	**Yes**	**N/A**	**N/A**	**N/A**	**N/A**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition).
Air districts in which feedstock activities may occur but that have not established any applicable annual thresholds are not listed.

As shown in Table 3.2-25, the sustainable forest management projects in the Lassen feedstock area, if undertaken simultaneously within any one air district, would exceed the Butte County AQMD annual thresholds for VOC and NO_X prior to mitigation. This impact would be **potentially significant** prior to mitigation.

Mitigation measures identified to reduce project-generated emissions and environmental impacts during feedstock activity include **MM-AQ-1** through **MM-AQ-4** as follows.

MM-AQ-1 (Operational Equipment Exhaust Minimization – Tier 4 Final – Feedstock Acquisition) would reduce criteria air pollutant emissions, specifically VOC, NO_X, PM_{10}, and $PM_{2.5}$, by requiring the project to minimize off-road equipment exhaust with Tier 4 Final equipment, which is quantified herein. **MM-AQ-2** (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility) would reduce emissions by limiting truck and equipment idling time. **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce emissions by incorporating renewable diesel fuel. **MM-AQ-4** (Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce emissions by encouraging workers to carpool. **MM-AQ-2** through **MM-AQ-4** are not quantified herein.

Table 3.2-26 presents the mitigated maximum daily criteria air pollutant emissions for the Lassen feedstock area for summer and winter.

Table 3.2-26. Estimated Maximum Daily Criteria Air Pollutant Emissions – Lassen Feedstock Area – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025 and Subsequent	29.97	601.65	952.52	2.69	1,856.64	324.78
Winter						
2025 and Subsequent	29.77	611.38	941.39	2.69	1,856.64	324.78
Maximum Daily Emissions	**29.97**	**611.38**	**952.52**	**2.69**	**1,856.64**	**324.78**
Butte County AQMD Threshold	137	137	N/A	N/A	150	150
Lassen County APCD Threshold	150	150	550	150	150	150
Northern Sierra AQMD Threshold	136	136	N/A	N/A	136	N/A
Shasta County AQMD Threshold	137	137	N/A	N/A	137	N/A
Tehama County APCD Threshold	137	137	N/A	N/A	137	N/A
Most Stringent Threshold	*136*	*136*	*550*	*150*	*136*	*150*
Most Stringent Threshold Exceeded?	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) and **MM-AQ-1** (Operational Equipment Exhaust Minimization – Tier 4 Final – Feedstock Acquisition).
Air districts in which feedstock activities may occur but that have not established any applicable daily thresholds are not listed.

As shown in Table 3.2-26, the sustainable forest management projects in the Lassen feedstock area, if undertaken simultaneously within any one air district, would exceed the most stringent applicable air district daily thresholds for NO_X, CO, PM_{10}, and $PM_{2.5}$ with incorporation of PDFs and mitigation. This impact would be **significant and unavoidable** with mitigation.

Table 3.2-27 presents the mitigated annual criteria air pollutant emissions for the Lassen feedstock area.

Table 3.2-27. Estimated Annual Criteria Air Pollutant Emissions – Lassen Feedstock Area – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2025 and Subsequent	2.61	53.46	82.56	0.24	146.90	26.86
Total Annual Emissions	**2.61**	**53.46**	**82.56**	**0.24**	**146.90**	**26.86**
Butte County AQMD Threshold	4.5	4.5	N/A	N/A	N/A	N/A
Most Stringent Threshold Exceeded?	**No**	**Yes**	**N/A**	**N/A**	**N/A**	**N/A**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition).
Air districts in which feedstock activities may occur but that have not established any applicable annual thresholds are not listed.

As shown in Table 3.2-27, the sustainable forest management projects in the Lassen feedstock area, if undertaken simultaneously within any one air district, would exceed the Butte County AQMD annual thresholds for NO_X with incorporation of PDFs and mitigation. This impact would be **significant and unavoidable** with mitigation.

Tuolumne Feedstock Area

Table 3.2-28 presents the unmitigated maximum daily criteria air pollutant emissions for the Tuolumne feedstock area for summer and winter compared to the most stringent air district daily threshold.

Table 3.2-28. Estimated Maximum Daily Criteria Air Pollutant Emissions – Tuolumne Feedstock Area – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025 and Subsequent	26.30	416.33	221.28	1.04	468.08	83.16
Winter						
2025 and Subsequent	26.22	420.26	214.43	1.04	468.08	83.16
Maximum Daily Emissions	**26.30**	**420.26**	**221.28**	**1.04**	**468.08**	**83.16**
Calaveras County APCD Threshold	150	150	N/A	N/A	150	N/A
El Dorado APCD Threshold	82	82	N/A	N/A	N/A	N/A
Feather River AQMD Threshold	25	25	N/A	N/A	80	N/A
Northern Sierra AQMD Threshold	136	136	N/A	N/A	136	N/A
Placer County APCD Threshold	55	55	N/A	N/A	82	N/A
Sacramento Metropolitan AQMD Threshold	65	65	N/A	N/A	80	82
Tuolumne County APCD Threshold	1,000	1,000	1,000	N/A	1,000	N/A
Most Stringent Threshold	*25*	*25*	*1,000*	*N/A*	*80*	*82*
Most Stringent Threshold Exceeded?	**Yes**	**Yes**	**No**	**N/A**	**Yes**	**Yes**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition).
Air districts in which feedstock activities may occur but that have not established any applicable daily thresholds are not listed.

As shown in Table 3.2-28, the sustainable forest management projects in the Tuolumne feedstock area, if undertaken simultaneously within any one air district, would exceed the most stringent applicable air district daily thresholds for VOC, NO_X, PM_{10}, and $PM_{2.5}$ with incorporation of PDFs and prior to mitigation. This impact would be **potentially significant** prior to mitigation.

Table 3.2-29 presents the unmitigated annual criteria air pollutant emissions for the Tuolumne feedstock area.

Table 3.2-29. Estimated Annual Criteria Air Pollutant Emissions – Tuolumne Feedstock Area – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2025 and Subsequent	2.55	40.75	20.93	0.10	40.98	7.62
Total Annual Emissions	**2.55**	**40.75**	**20.93**	**0.10**	**40.98**	**7.62**
Feather River AQMD Threshold	4.5	4.5	N/A	N/A	N/A	N/A
Mariposa County APCD Threshold	100	100	100	100	100	100
Sacramento Metropolitan AQMD Threshold	N/A	N/A	N/A	N/A	14.6	15
San Joaquin Valley APCD Threshold	10	10	100	27	15	15
Tuolumne County APCD Threshold	100	100	100	N/A	100	N/A
Most Stringent Threshold	*4.5*	*4.5*	*100*	*27*	*14.6*	*15*
Most Stringent Threshold Exceeded?	**No**	**Yes**	**No**	**No**	**Yes**	**No**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition).
Air districts in which feedstock activities may occur but that have not established any applicable annual thresholds are not listed.

As shown in Table 3.2-29, the sustainable forest management projects in the Tuolumne feedstock area, if undertaken simultaneously within any one air district, would exceed the most stringent applicable air district annual thresholds for NO_X and PM_{10} with incorporation of PDFs and prior to mitigation. This impact would be **potentially significant** prior to mitigation.

As described for the Lassen feedstock area, **MM-AQ-1** (Operational Equipment Exhaust Minimization – Tier 4 Final – Feedstock Acquisition) would reduce criteria air pollutant emissions, which is quantified. **MM-AQ-2** (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility), **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-4** (Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would also reduce criteria air pollutant emissions but are not quantified herein.

Table 3.2-30 presents the mitigated maximum daily criteria air pollutant emissions for the Tuolumne feedstock area for summer and winter.

Table 3.2-30. Estimated Maximum Daily Criteria Air Pollutant Emissions – Tuolumne Feedstock Area – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025 and Subsequent	10.58	267.06	391.13	1.04	461.50	77.26
Winter						
2025 and Subsequent	10.50	270.99	384.28	1.04	461.50	77.26

Table 3.2-30. Estimated Maximum Daily Criteria Air Pollutant Emissions – Tuolumne Feedstock Area – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Maximum Daily Emissions	**10.58**	**270.99**	**391.13**	**1.04**	**461.50**	**77.26**
Calaveras County APCD Threshold	150	150	N/A	N/A	150	N/A
El Dorado APCD Threshold	82	82	N/A	N/A	N/A	N/A
Feather River AQMD Threshold	25	25	N/A	N/A	80	N/A
Northern Sierra AQMD Threshold	136	136	N/A	N/A	136	N/A
Placer County APCD Threshold	55	55	N/A	N/A	82	N/A
Sacramento Metropolitan AQMD Threshold	65	65	N/A	N/A	80	82
Tuolumne County APCD Threshold	1,000	1,000	1,000	N/A	1,000	N/A
Most Stringent Threshold	*25*	*25*	*1,000*	*N/A*	*80*	*82*
Most Stringent Threshold Exceeded?	**No**	**Yes**	**No**	**N/A**	**Yes**	**No**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) and **MM-AQ-1** (Operational Equipment Exhaust Minimization – Tier 4 Final – Feedstock Acquisition).
Air districts in which feedstock activities may occur but that have not established any applicable daily thresholds are not listed.

As shown in Table 3.2-30, the sustainable forest management projects in the Tuolumne feedstock area, if undertaken simultaneously within any one air district, would exceed the most stringent applicable air district daily thresholds for NO_X, and PM_{10}, with incorporation of PDFs and mitigation. This impact would be **significant and unavoidable** with mitigation.

Table 3.2-31 presents the mitigated annual criteria air pollutant emissions for the Tuolumne feedstock area.

Table 3.2-31. Estimated Annual Criteria Air Pollutant Emissions – Tuolumne Feedstock Area – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2025 and Subsequent	1.02	26.27	37.40	0.10	40.34	7.05
Total Annual Emissions	**1.02**	**26.27**	**37.40**	**0.10**	**40.34**	**7.05**
Feather River AQMD Threshold	4.5	4.5	N/A	N/A	N/A	N/A
Mariposa County APCD Threshold	100	100	100	100	100	100
Sacramento Metropolitan AQMD Threshold	N/A	N/A	N/A	N/A	14.6	15
San Joaquin Valley APCD Threshold	10	10	100	27	15	15
Tuolumne County APCD Threshold	100	100	100	N/A	100	N/A
Most Stringent Threshold	*4.5*	*4.5*	*100*	*27*	*14.6*	*15*
Most Stringent Threshold Exceeded?	**No**	**Yes**	**No**	**No**	**Yes**	**No**

Notes: AQMD = Air Quality Management District; APCD = Air Pollution Control District; VOC = volatile organic compound; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) and **MM-AQ-1** (Operational Equipment Exhaust Minimization – Tier 4 Final – Feedstock Acquisition).
Air districts in which feedstock activities may occur but that have not established any applicable annual thresholds are not listed.

As shown in Table 3.2-31, the sustainable forest management projects in the Tuolumne feedstock area, if undertaken simultaneously within any one air district, would exceed the most stringent applicable air district annual thresholds for NO_X and PM_{10} with incorporation of PDFs and mitigation. This impact would be **significant and unavoidable** with mitigation.

Feedstock Acquisition - Conclusion

As shown in Tables 3.2-24, 3.2-25, 3.2-28, and 3.2-29, feedstock acquisition in the Lassen feedstock area and the Tuolumne feedstock area, if undertaken simultaneously within any one air district, would have the potential to exceed numerical thresholds of significance established by Butte County AQMD, Calaveras County APCD, El Dorado APCD, Feather River AQMD, Lassen County AQMD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD, Shasta County AQMD, and Tehama County APCD for VOC, NOX, CO, PM10, and PM2.5, with implementation of PDF-AQ-1 (Air District Regulatory Compliance – Feedstock Acquisition) and PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) and prior to mitigation. Of the 14 counties located within these air districts, 11 are nonattainment for one of these pollutants, or for O_3, to which VOC and NOx are precursors (see Table 3.2-1), and therefore this would be a **potentially significant** impact.

After implementation of **MM-AQ-1** through **MM-AQ-4**, which provide for Tier 4 Final engines in offroad equipment, limit truck and offroad equipment idling, incorporate renewable diesel fuel in trucks and offroad equipment, and educate workers to optimize their commutes, and as shown in Tables 3.2-26, 3.2-27, 3.2-30, and 3.2-31, the emissions during feedstock acquisition in each area, if undertaken simultaneously within any one air district, would still exceed the numerical thresholds of significance established by Butte County AQMD, Calaveras County APCD, El Dorado APCD, Feather River AQMD, Lassen County AQMD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD, Shasta County AQMD, and Tehama County APCD for NO_X, CO, PM_{10}, and $PM_{2.5}$. Since this represents a cumulatively considerable net increase within counties that are nonattainment for these pollutants, or for O_3, the impact related to this portion of the project would be **significant and unavoidable** with mitigation.

Wood Pellet Production

Lassen Facility

Construction Emissions

Proposed construction activities 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 VOC off-gassing) and off-site sources (i.e., on-road vendor trucks and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity; the specific type of operation; and, for particulate matter, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated.

CalEEMod Version 2022.1.1.25 was used to estimate emissions from construction of the project. Internal combustion engines used by construction equipment, trucks, and worker vehicles would result in emissions of

VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions would also be generated by entrained dust, which results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil. As described in Section 3.2.4.1.2, the project would implement SDF-AQ-1 (Air District Regulatory Compliance – Lassen Facility, Tuolumne Facility, and Port of Stockton) and SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton) at the Lassen Facility, which would require air district regulatory compliance and fugitive dust control. SDF-AQ-2 is quantified in the construction analysis within CalEEMod where "water three times per day," "water demolished area," "water unpaved construction roads," and "limit vehicle speeds on unpaved roads" were selected to reduce fugitive dust emissions.

Table 3.2-32 presents the estimated maximum daily construction emissions generated during construction of the Lassen Facility for summer and winter. Details of the emission calculations are provided in Appendix B1.

Table 3.2-32. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Lassen Facility - Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025	172.01	155.55	186.41	0.37	19.03	8.73
Winter						
2024	6.04	63.58	60.91	0.11	12.06	6.39
2025	170.21	168.85	194.08	0.40	20.05	9.23
Maximum	**172.01**	**168.85**	**194.08**	**0.40**	**20.05**	**9.23**
Lassen County APCD Daily BACT Threshold	150	150	550	150	150	150
Threshold Exceeded?	**Yes**	**Yes**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; Lassen County APCD = Lassen County Air Pollution Control District; BACT = best available control technology.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).

As shown in Table 3.2-32, construction of the Lassen Facility would exceed the Lassen County APCD daily BACT thresholds for VOC, NO_x, and CO with incorporation of SDFs and prior to mitigation. This impact would be **potentially significant** prior to mitigation.

The Lassen County APCD has not established annual thresholds for criteria air pollutants. However, Table 3.2-33 presents the unmitigated annual construction criteria air pollutant emissions for informational purposes.

Table 3.2-33. Estimated Annual Construction Criteria Air Pollutant Emissions – Lassen Facility – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2024	0.11	1.15	1.12	<0.01	0.21	0.11
2025	6.06	17.25	20.30	0.04	1.89	0.86
Maximum	**6.06**	**17.25**	**20.30**	**0.04**	**1.89**	**0.86**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).

Mitigation measures identified to reduce project-generated emissions and environmental impacts during construction of the Lassen Facility include **MM-AQ-5** through **MM-AQ-7** as follows.

MM-AQ-5 (Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility) would reduce criteria air pollutant emissions, specifically VOC, NO_X, PM_{10}, and $PM_{2.5}$, by requiring the project to minimize construction off-road equipment exhaust with Tier 4 Final equipment, which is quantified. **MM-AQ-6** (Construction Lower-VOC Paints – Lassen Facility) would reduce VOC emissions by requiring a lower VOC paint, which is quantified. **MM-AQ-7** (Construction Activities Notification -- Lassen Facility, Tuolumne Facility, and Port of Stockton) would require the project to provide public notification of the construction activity. **MM-AQ-7** is not quantified herein.

Furthermore, **MM-AQ-2** (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility), **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton), and **MM-AQ-4** (Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce impacts during construction at the Lassen Facility but are not quantified herein.

Table 3.2-34 presents the mitigated maximum daily construction criteria air pollutant emissions for the Lassen Facility for summer and winter.

Table 3.2-34. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Lassen Facility - Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025	142.11	95.43	201.08	0.37	16.48	6.41
Winter						
2024	1.22	12.96	55.96	0.11	9.74	4.27
2025	141.31	103.65	209.38	0.40	17.26	6.69
Maximum	**142.11**	**103.65**	**209.38**	**0.40**	**17.26**	**6.69**
Lassen County APCD Daily BACT Threshold	150	150	550	150	150	150
Threshold Exceeded?	No	No	No	No	No	No

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; Lassen County APCD = Lassen County Air Pollution Control District; BACT = best available control technology.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton), MM-AQ-5 (Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility), and **MM-AQ-6** (Construction Lower-VOC Paints – Lassen Facility).

As shown in Table 3.2-34, construction of the Lassen Facility would not exceed the Lassen County APCD daily BACT thresholds with incorporation of SDFs and mitigation.

The Lassen County APCD has not established annual thresholds for criteria air pollutants. However, Table 3.2-35 presents the mitigated annual construction criteria air pollutant emissions for informational purposes.

Table 3.2-35. Estimated Annual Construction Criteria Air Pollutant Emissions – Lassen Facility – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2024	0.02	0.27	1.06	<0.01	0.17	0.07
2025	4.83	11.30	22.17	0.04	1.64	0.64
Maximum Emissions	**4.83**	**11.30**	**22.17**	**0.04**	**1.64**	**0.64**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).

Overall, construction of the Lassen Facility would not exceed the Lassen County APCD daily BACT thresholds with incorporation of SDFs and mitigation.

Construction Air Quality Impact Assessment

Although the project would not exceed the maximum daily significance threshold established by the Lassen County APCD BACT requirements for any criteria pollutant with the inclusion of mitigation, the project would emit more than 100 pounds of VOC, NO_x, and CO per day onsite during construction. As recommended by the Guidance for Assessing and Mitigating Air Quality Impacts (San Joaquin Valley APCD 2015a), an ambient air quality impacts assessment should be performed if any pollutants exceed 100 pounds per day during construction or operation. Maximum daily emissions were used as the basis for determining the project's potential impact on ambient air quality. Summary tables of annual and daily emissions associated with construction are included in Appendix B3.

For the initial assessment (Step 1) of the ambient air quality impact analysis, the maximum background concentration for the Lassen Facility for each pollutant and averaging period combination was added to the corresponding maximum ground level concentration (GLC) from 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 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 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 this second step, the maximum GLC of each pollutant and averaging period combination were compared to its corresponding SIL. The SIL is used to evaluate whether the 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 GLC did not exceed the corresponding SIL, then the analysis was complete for that source/receptor/pollutant combination, and no further analysis was required. Table 3.2-36 presents a summary of the Air Quality Impact Assessment undertaken to determine whether construction activities associated with the project would cause or contribute to ambient air quality impacts.

Table 3.2-36. Lassen Facility Construction Air Quality Impact Assessment - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m3						
1-hour CO	State	1.7	1,948	78.54	2,026	22,900	PASS	2000	Step 1
	Federal	1.7	1,948	78.54	2,026	40,100	PASS	2000	Step 1
8-hour CO	State	1.5	1,718	11.26	1,730	10,300	PASS	500	Step 1
	Federal	1.5	1,718	11.26	1,730	10,300	PASS	500	Step 1
1-hour NO_2	State	0.032	60	52.80	113	339	PASS	7.5	Step 1
	Federal	0.032	60	52.80	113	188	PASS	7.5	Step 1
Annual NO_2	State	0.005	10	0.84	10	57	PASS	1	Step 1
	Federal	0.005	9	0.84	10	100	PASS	1	Step 1
1-hour SO_2	State	0.001	3	0.13	3	655	PASS	7.8	Step 1
	Federal	0.001	3	0.13	3	196	PASS	7.8	Step 1
24-Hour SO_2	State	0.001	3	0.01	3	105	PASS	5	Step 1
	Federal	0.001	3	0.01	3	367	PASS	5	Step 1
Annual SO_2	Federal	0.000	1	0.00	1	79	PASS	1	Step 1
24-hour PM_{10}	State	–	117	0.18	117	50	Step 2	5	PASS
	Federal	–	117	0.18	117	150	PASS	5	Step 1
Annual PM_{10}	State	–	19	0.05	19	20	PASS	1	Step 1
24-hour $PM_{2.5}$	Federal	–	303	0.15	303	35	Step 2	1.2	PASS
Annual $PM_{2.5}$	State	–	15	0.04	15	12	Step 2	0.3	PASS
	Federal*	–	15	0.04	15	9	Step 2	0.13	PASS

Source: See Appendix B3.
Notes: ppmv = parts per million by volume; µg/m3 = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).
As discussed in Section 3.2.1.3, the closest monitoring station for NO_2 is 102 miles, PM_{10} is 69 miles, and $PM_{2.5}$ is 87 miles from the project site because the NEPAB is in attainment for these pollutants. Therefore, the background concentrations used in this AQIA are from areas that may not be representative of the project site and may overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

Table 3.2-37. Lassen Facility Construction Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m3						
1-hour CO	State	1.7	1,948	86.09	2,034	22,900	PASS	2000	Step 1
	Federal	1.7	1,948	86.09	2,034	40,100	PASS	2000	Step 1
8-hour CO	State	1.5	1,718	12.34	1,731	10,300	PASS	500	Step 1
	Federal	1.5	1,718	12.34	1,731	10,300	PASS	500	Step 1
1-hour NO_2	State	0.032	60	27.03	87	339	PASS	7.5	Step 1
	Federal	0.032	60	27.03	87	188	PASS	7.5	Step 1
Annual NO_2	State	0.005	10	0.43	10	57	PASS	1	Step 1
	Federal	0.005	9	0.43	10	100	PASS	1	Step 1
1-hour SO_2	State	0.001	3	0.13	3	655	PASS	7.8	Step 1
	Federal	0.001	3	0.13	3	196	PASS	7.8	Step 1
24-Hour SO_2	State	0.001	3	0.01	3	105	PASS	5	Step 1
	Federal	0.001	3	0.01	3	367	PASS	5	Step 1
Annual SO_2	Federal	0.000	1	0.00	1	79	PASS	1	Step 1
24-hour PM_{10}	State	–	117	0.19	117	50	Step 2	5	PASS
	Federal	–	117	0.19	117	150	PASS	5	Step 1
Annual PM_{10}	State	–	19	0.05	19	20	PASS	1	Step 1
24-hour $PM_{2.5}$	Federal	–	303	0.09	303	35	Step 2	1.2	PASS
Annual $PM_{2.5}$	State	–	15	0.02	15	12	Step 2	0.3	PASS
	Federal*	–	15	0.02	15	9	Step 2	0.13	PASS

Source: See Appendix B3.
Notes: ppmv = parts per million by volume; ug/m3 = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton), **MM-AQ-5** (Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility), and **MM-AQ-6** (Construction Lower-VOC Paints – Lassen Facility).
As discussed in Section 3.2.1.3, the closest monitoring station for NO_2 is 102 miles, PM_{10} is 69 miles, and $PM_{2.5}$ is 87 miles from the project site because the NEPAB is in attainment for these pollutants. Therefore, the background concentrations used in this AQIA are from areas that may not be representative of the project site and may overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

As shown in Table 3.2-36, the unmitigated construction emissions would not exceed the AAQS for the CO, NO_2, and SO_2 or the SILs for PM_{10} and $PM_{2.5}$ with incorporation of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton). As such, no AAQS is expected to be exceeded during construction. Regardless, Table 3.2-37 shows the mitigated construction emissions, including application of **MM-AQ-2** through **MM-AQ-7**, with **MM-AQ-5** and **MM-AQ-6** being quantified. These mitigation measures are listed as follows:

- **MM-AQ-2: Construction and Operation Limit Truck and Equipment Idling** – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility
- **MM-AQ-3: Construction and Operation Renewable Diesel Fuel** – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-4: Construction and Operational Worker Commute Optimization** – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-5: Construction Equipment Exhaust Minimization** – Tier 4 Final – Lassen Facility
- **MM-AQ-6: Construction Lower-VOC Paints** – Lassen Facility
- **MM-AQ-7: Construction Activities Notification** – Lassen Facility, Tuolumne Facility, and Port of Stockton

As shown in Table 3.2-37, the mitigated construction emissions would not exceed the AAQS for the CO, NO_2, and SO_2 or the SILs for PM_{10} and $PM_{2.5}$. As such, no AAQS is expected to be exceeded during construction. For the reasons noted above, the impact related to this portion of the project would be **less than significant.**

Operational Emissions

Operation at the Lassen Facility would generate VOC, NO_x, CO, SO_X, PM_{10}, and $PM_{2.5}$ emissions from area sources (consumer products and architectural coatings), mobile sources (worker vehicles, vendor trucks, and logging/haul trucks), off-road equipment, stationary equipment, and rail sources (switcher locomotive and line-haul trains). As discussed in Section 3.2.4.1.2, pollutant emissions associated with long-term operations were quantified using a combination of project-specific information and CalEEMod default values.

Table 3.2-38 presents the estimated maximum daily unmitigated operational emissions associated with Lassen Facility operation and anticipated project activities within the Lassen County APCD jurisdictional boundaries for summer and winter.

Table 3.2-38. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	9.05	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.59	4.14	13.05	0.05	3.44	0.91
Off-Road Equipment	1.21	11.33	21.65	0.03	0.44	0.41
Stationary Equipment	1,146.55	782.61	1,372.45	1.37	836.34	832.23
Logging/Haul Trucks[a]	1.73	113.52	28.49	0.67	29.66	9.56

Table 3.2-38. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Rail[b]	18.04	426.54	103.11	0.40	9.74	8.96
Switcher Locomotive	0.47	10.59	1.04	0.01	0.26	0.24
Total	*1,177.64*	*1,348.73*	*1,539.79*	*2.53*	*879.88*	*852.31*
Winter						
Area	9.05	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.58	4.78	11.40	0.05	3.44	0.91
Off-Road Equipment	1.21	11.33	21.65	0.03	0.44	0.41
Stationary Equipment	1,146.55	782.61	1,372.45	1.37	836.34	832.23
Logging/Haul Trucks[a]	1.68	119.90	28.69	0.67	29.66	9.56
Rail[b]	18.04	426.54	103.11	0.40	9.74	8.96
Switcher Locomotive	0.47	10.59	1.04	0.01	0.26	0.24
Total	*1,177.58*	*1,355.75*	*1,538.34*	*2.53*	*879.88*	*852.31*
Maximum	**1,177.64**	**1,355.75**	**1,539.79**	**2.53**	**879.88**	**852.31**
Lassen County APCD Daily BACT Threshold	150	150	550	150	150	150
Threshold Exceeded?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Lassen County APCD = Lassen County Air Pollution Control District; BACT = best available control technology.

[a] Logging/Haul Trucks emissions include the emissions from all of the Lassen logging/haul trucks assuming a 54.5-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Lassen County APCD boundaries concurrently.

[b] Rail emissions include the line haul train emissions within the Lassen County APCD.

As shown in Table 3.2-38, the project would exceed the daily Lassen County APCD thresholds for VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$ prior to mitigation. This impact would be **potentially significant** prior to mitigation.

The Lassen County APCD has not established annual thresholds for criteria air pollutants. However, Table 3.2-39 presents the estimated unmitigated annual operational emissions for the Lassen Facility and anticipated project activities within the Lassen County APCD jurisdictional boundaries for informational purposes.

Table 3.2-39. Estimated Annual Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	1.65	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.10	0.81	2.10	0.01	0.61	0.16
Off-Road Equipment	0.20	1.90	3.63	0.01	0.07	0.07
Stationary Equipment	192.0	131.1	229.9	0.23	140.1	139.4

Table 3.2-39. Estimated Annual Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Logging/Haul Trucks[a]	0.15	10.50	2.52	0.06	2.56	0.83
Rail[b]	0.63	14.93	3.61	0.01	0.34	0.31
Switcher Locomotive	0.02	0.37	0.04	0.00	0.01	0.01
Total	**194.75**	**159.61**	**241.80**	**0.32**	**143.69**	**140.78**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Lassen County APCD = Lassen County Air Pollution Control District; BACT = best available control technology.

a Logging/Haul Trucks emissions include the emissions from all the Lassen logging/haul trucks assuming a 54.5-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Lassen County APCD boundaries concurrently.

b Rail emissions include the line haul train emissions within the Lassen County APCD.

Mitigation measures identified to reduce project-generated emissions during operation at the Lassen Facility include **MM-AQ-8** and **MM-AQ-9** as follows.

MM-AQ-8 (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce criteria air pollutant emissions, specifically VOC, NO_X, SO_X, PM_{10}, and $PM_{2.5}$, by requiring the project to minimize operational off-road equipment exhaust with Tier 4 Final equipment, which is quantified. **MM-AQ-9** (Operational Switcher Locomotive Exhaust Minimization – Lassen Facility) would reduce criteria air pollutant emissions by requiring a Tier 4 Final engine for the on-site switcher locomotive at the Lassen Facility, which is quantified.

Furthermore, **MM-AQ-2** (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility), **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton), and **MM-AQ-4** (Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce impacts during operation at the Lassen Facility but are not quantified herein.

Table 3.2-40 presents the estimated maximum mitigated daily operational criteria air pollutant emissions for the Lassen Facility and anticipated project activities within the Lassen County APCD jurisdictional boundaries for summer and winter.

Table 3.2-40. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD - Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	9.05	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.59	4.14	13.05	0.05	3.44	0.91
Off-Road Equipment	0.33	1.70	24.17	0.03	0.07	0.07

Table 3.2-40. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD - Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Stationary Equipment	1,146.55	782.61	1,372.45	1.37	836.34	832.23
Logging/Haul Trucks[a]	1.73	113.52	28.49	0.67	29.66	9.56
Portion of Rail[b]	18.04	426.54	103.11	0.40	9.74	8.96
Switcher Locomotive	0.04	0.81	1.04	0.00	0.02	0.01
Total	*1,176.33*	*1,329.32*	*1,542.31*	*2.52*	*879.27*	*851.74*
Winter						
Area	9.05	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.58	4.78	11.40	0.05	3.44	0.91
Off-Road Equipment	0.33	1.70	24.17	0.03	0.07	0.07
Stationary Equipment	1,146.55	782.61	1,372.45	1.37	836.34	832.23
Logging/Haul Trucks[a]	1.68	119.90	28.69	0.67	29.66	9.56
Portion of Rail[b]	18.04	426.54	103.11	0.40	9.74	8.96
Switcher Locomotive	0.04	0.81	1.04	0.00	0.02	0.01
Total	*1,176.27*	*1,336.34*	*1,540.86*	*2.52*	*879.27*	*851.74*
Maximum	**1,176.33**	**1,336.34**	**1,542.31**	**2.52**	**879.27**	**851.74**
Lassen County APCD Daily BACT Threshold	150	150	550	150	150	150
Threshold Exceeded?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Lassen County APCD = Lassen County Air Pollution Control District; BACT = best available control technology.

[a] Logging/Haul Trucks emissions include the emissions from all of the Lassen logging/haul trucks assuming a 54.5-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Lassen County APCD boundaries concurrently.

[b] Rail emission include the line haul train emissions within the Lassen County APCD.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-9** (Operational Switcher Locomotive Exhaust Minimization – Lassen Facility).

As shown in Table 3.2-40, the project would exceed the daily Lassen County APCD thresholds for VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$ with mitigation.

The Lassen County APCD has not established annual thresholds for criteria air pollutants. However, Table 3.2-41 presents the estimated mitigated annual operational emissions for the Lassen Facility and anticipated project activities within the Lassen County APCD jurisdictional boundaries for informational purposes.

Table 3.2-41. Estimated Annual Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	1.65	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0

Table 3.2-41. Estimated Annual Operation Criteria Air Pollutant Emissions – Lassen Facility and Project Activities within Lassen County APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Mobile	0.10	0.81	2.10	0.01	0.61	0.16
Off-Road Equipment	0.05	1.09	6.15	0.01	0.01	0.01
Stationary Equipment	192.0	131.1	229.9	0.23	140.1	139.4
Logging/Haul Trucks[a]	0.15	10.50	2.52	0.06	2.56	0.83
Rail[b]	0.63	14.93	3.61	0.01	0.34	0.31
Switcher Locomotive	0.00	0.03	0.04	0.00	0.00	0.00
Total	**194.58**	**158.46**	**244.32**	**0.32**	**143.62**	**140.71**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Lassen County APCD = Lassen County Air Pollution Control District; BACT = best available control technology.

[a] Logging/Haul Trucks emissions include the emissions from all of the Lassen logging/haul trucks assuming a 54.5-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Lassen County APCD boundaries concurrently.

[b] Rail emissions include the line haul train emissions within the Lassen County APCD.

If 100% of feedstock acquisition and Lassen Facility operations (including line haul transport) occur within Lassen County APCD jurisdictional boundaries *at the same time*, the combined maximum daily emissions from Table 3.2-26 and Table 3.2-40 would be approximately 1,206 pounds per day of VOC, 1,948 pounds per day of NO_x, 2,495 pounds per day of CO, 5 pounds per day SO_X, 2,736 pounds per day of PM_{10}, and 1,177 pounds per day of $PM_{2.5}$ with incorporation of PDFs and mitigation, which is a conservative estimate. (As noted above, this is unlikely in practice; however, more precise determination of the percentage of these activities occurring within Lassen County APCD boundaries at any given time is impracticable at this stage, since the location and timing of specific feedstock acquisition and line haul transport activities is not yet known.) Note that even under this scenario, the majority of daily feedstock and rail-related emissions would not occur in the immediate vicinity of the Facility site.

Pellet storage at the Lassen Facility would result in negligible emissions of VOC from woody biomass decomposition. However, VOC concentrations associated with storage of wood pellets are very low, especially at shorter storage durations. More VOCs are emitted from stored sawdust and wood chips compared to stored wood pellets (Yazdanpanah et al. 2014). However, the project's intent is to convert all useable woody biomass into pellets and the remainder into dryer fuel, rather than disposal or long-term storage. Due to these factors, additional VOC emissions from pellet storage would be negligible.

Operational Air Quality Impact Assessment

The project would exceed the maximum daily significance threshold established by the Lassen County APCD BACT requirements for VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$ with the inclusion of mitigation, and the project would emit more than 100 pounds of VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$ per day onsite during operation. As recommended by the Guidance for Assessing and Mitigating Air Quality Impacts (San Joaquin Valley APCD 2015a), an ambient air quality impacts assessment should be performed if any pollutants exceed 100 pounds per day during construction or operation. Maximum daily emissions were used as the basis for determining the project's potential impact on ambient air quality. Summary tables of annual and daily emissions associated with operation are included in Appendix B3.

For the initial assessment (Step 1) of the ambient air quality impact analysis, the maximum background concentration for the Lassen Facility for each pollutant and averaging period combination was added to the corresponding maximum ground level concentration (GLC) from 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 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 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 this second step, the maximum GLC of each pollutant and averaging period combination were compared to its corresponding SIL. The SIL is used to evaluate whether the 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 GLC did not exceed the corresponding SIL, then the analysis was complete for that source/receptor/pollutant combination, and no further analysis was required. Table 3.2-42 presents a summary of the Air Quality Impact Assessment undertaken to determine whether construction activities associated with the project would cause or contribute to ambient air quality impacts.

As shown in Table 3.2-42, the unmitigated operational emissions would exceed the SILs for the CO, NO_2, PM_{10}, and $PM_{2.5}$ AAQS. As such, a level 2 analysis is required. The Level 2 analysis showed the project would still exceed the AAQS for the 1-hour NO_2, 24-hour and annual PM_{10} and $PM_{2.5}$. This would be a **potentially significant** impact, and therefore, mitigation is required.

Table 3.2-43 shows the mitigated operational emissions including application of **MM-AQ-2**, **MM-AQ-3**, **MM-AQ-4**, **MM-AQ-8**, and **MM-AQ-9**, with **MM-AQ-8** and **MM-AQ-9** being quantified. These mitigation measures are listed as follows:

- **MM-AQ-2: Construction and Operation Limit Truck and Equipment Idling –** Feedstock Acquisition, Lassen Facility, and Tuolumne Facility
- **MM-AQ-3: Construction and Operation Renewable Diesel Fuel –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-4: Construction and Operational Worker Commute Optimization –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-8: Operational Equipment Exhaust Minimization –** Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-9: Operational Switcher Locomotive Exhaust Minimization –** Lassen Facility

As demonstrated in Table 3.2-43, the project would result in operational activities that would generate ambient concentrations of criteria pollutants (NO_2, PM_{10}, and $PM_{2.5}$) above one or more of the applicable thresholds with application of mitigation.

Table 3.2-42. Lassen Facility Operational Air Quality Impact Assessment - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m^3						
Level 1 AAQA									
1-hour CO	State	1.7	1,948	34,531.78	36,479	22,900	Step 2	2000	**Fail**
	Federal	1.7	1,948	34,531.78	36,479	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	15,020.32	16,739	10,300	Step 2	500	**Fail**
	Federal	1.5	1,718	15,020.32	16,739	10,300	Step 2	500	**Fail**
1-hour NO_2	State	0.032	60	16,232.34	16,293	339	Step 2	7.5	**Fail**
	Federal	0.032	60	16,232.34	16,292	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.005	10	1,894.40	1,904	57	Step 2	1	**Fail**
	Federal	0.005	9	1,894.40	1,904	100	Step 2	1	**Fail**
1-hour SO_2	State	0.001	3	35.13	38	655	**PASS**	7.8	Step 1
	Federal	0.001	3	35.13	38	196	**PASS**	7.8	Step 1
24-Hour SO_2	State	0.001	3	10.01	13	105	**PASS**	5	Step 1
	Federal	0.001	3	10.01	13	367	**PASS**	5	Step 1
Annual SO_2	Federal	0.000	1	3.28	4	79	**PASS**	1	Step 1
24-hour PM_{10}	State	--	117	5,848.50	5,965	50	Step 2	5	**Fail**
	Federal	--	117	5,848.50	5,965	150	Step 2	5	**Fail**
Annual PM_{10}	State	--	19	1,916.76	1,936	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	--	303	5,818.53	6,121	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	--	15	1,906.93	1,922	12	Step 2	0.3	**Fail**
	Federal*	--	15	1,906.93	1,922	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour CO	State	7.4	8,477	274.49	8,752	22,900	**PASS**	2000	Step 1

Table 3.2-42. Lassen Facility Operational Air Quality Impact Assessment - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m3						
8-hour CO	State	4.9	5,613	175.18	5,789	10,300	PASS	500	Step 1
	Federal	4.9	5,613	175.18	5,789	10,300	PASS	500	Step 1
1-hour NO_2	State	0.033	62	168.91	231	339	PASS	7.5	Step 1
	Federal	0.033	62	168.91	231	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.005	10	14.83	24	57	PASS	1	Step 1
	Federal	0.005	9	14.83	24	100	PASS	1	Step 1
24-hour PM_{10}	State	–	117	90.19	207	50	Step 2	5	**Fail**
	Federal	–	117	90.19	207	150	Step 2	5	**Fail**
Annual PM_{10}	State	–	19	15.85	35	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	309	51.09	360	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	15	15.83	31	12	Step 2	0.3	**Fail**
	Federal*	–	15	15.83	31	9	Step 2	0.13	**Fail**

Source: See Appendix B3.

Notes: ppmv = parts per million by volume; µg/m³ = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.

As discussed in Section 3.2.1.3, the closest monitoring station for NO_2 is 102 miles, PM_{10} is 69 miles, and $PM_{2.5}$ is 87 miles from the project site because the NEPAB is in attainment for these pollutants. Therefore, the background concentrations used in this AQIA are from areas that may not be representative of the project site and may overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

Table 3.2-43. Lassen Facility Operational Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m³						
Level 1									
1-hour CO	State	1.7	1,948	34,599	36,547	22,900	Step 2	2000	**Fail**
	Federal	1.7	1,948	34,599	36,547	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	15,050	16,768	10,300	Step 2	500	**Fail**
	Federal	1.5	1,718	15,050	16,768	10,300	Step 2	500	**Fail**
1-hour NO_2	State	0.032	60	16,027	16,087	339	Step 2	7.5	**Fail**
	Federal	0.032	60	16,027	16,087	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.005	13	1,870	1,883	57	Step 2	1	**Fail**
	Federal	0.005	13	1,870	1,883	100	Step 2	1	**Fail**
1-hour SO_2	State	0.001	3	35	38	655	**PASS**	7.8	Step 1
	Federal	0.001	3	35	38	196	**PASS**	7.8	Step 1
24-Hour SO_2	State	0.001	3	10	13	105	**PASS**	1	Step 1
	Federal	0.001	3	10	13	367	**PASS**	1	Step 1
Annual SO_2	Federal	0.000	0	3	4	79	**PASS**	0	Step 1
24-hour PM_{10}	State	--	117	5,846	5,962	50	Step 2	5	**Fail**
	Federal	--	117	5,846	5,962	150	Step 2	5	**Fail**
Annual PM_{10}	State	--	19	1,916	1,935	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	--	303	5,816	6,118	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	--	15	1,906	1,921	12	Step 2	0.3	**Fail**
	Federal*	--	15	1,906	1,921	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour CO	State	1.7	1,948	274.50	2,222	22,900	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	175.24	1,894	10,300	**PASS**	500	Step 1

Table 3.2-43. Lassen Facility Operational Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
1-hour NO_2	Federal	1.5	1,718	175.24	1,894	10,300	**PASS**	500	Step 1
	State	0.032	60	168.11	228	339	**PASS**	7.5	Step 1
	Federal	0.032	60	168.11	228	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.005	13	14.36	27	57	**PASS**	1	Step 1
	Federal	0.005	13	14.36	27	100	**PASS**	1	Step 1
24-hour PM_{10}	State	--	117	90.18	207	50	Step 2	5	**Fail**
	Federal	--	117	90.18	207	150	Step 2	5	**Fail**
Annual PM_{10}	State	--	19	15.84	35	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	--	303	51.06	354	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	--	15	15.82	31	12	Step 2	0.3	**Fail**
	Federal*	--	15	15.82	31	9	Step 2	0.13	**Fail**

Source: See Appendix B3.

Notes: ppmv = parts per million by volume; ug/m3 = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO2 = nitrogen dioxide; SO2 = sulfur dioxide; PM10 = particulate matter with an aerodynamic diameter less than or equal to 10 microns; PM2.5 = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-9** (Operational Switcher Locomotive Exhaust Minimization – Lassen Facility).

As discussed in Section 3.2.1.3, the closest monitoring station for NO_2 is 102 miles, PM_{10} is 69 miles, and $PM_{2.5}$ is 87 miles from the project site because the NEPAB is in attainment for these pollutants. Therefore, the background concentrations used in this AQIA are from areas that may not be representative of the project site and may overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

Lassen Facility - Conclusion

As shown in Table 3.2-38, operational emissions at the Lassen Facility would have the potential to exceed daily BACT thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$ prior to mitigation. After implementation of **MM-AQ-2** through **MM-AQ-4**, **MM-AQ-8**, and **MM-AQ-9**, and as shown in Table 3.2-40, the operational emissions at the Lassen Facility would still exceed daily BACT thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$. Furthermore, operations at the Lassen Facility would generate ambient concentrations of criteria pollutants (NO_2, PM_{10}, and $PM_{2.5}$) above one or more of the applicable thresholds with application of mitigation. While this represents a cumulatively considerable net increase, Lassen County is not nonattainment for any of these pollutants, or for O_3, and therefore the impact related to this portion of the project is **less than significant.**

Tuolumne Facility

Construction Emissions

Proposed construction activities 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 VOC off-gassing) and off-site sources (i.e., on-road vendor trucks and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity; the specific type of operation; and, for particulate matter, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated.

CalEEMod Version 2022.1.1.25 was used to estimate emissions from construction of the project. Internal combustion engines used by construction equipment, trucks, and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions would also be generated by entrained dust, which results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil. As described in Section 3.2.4.1.2, the project would implement SDF-AQ-1 (Air District Regulatory Compliance – Lassen Facility, Tuolumne Facility, and Port of Stockton) and SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton) at the Tuolumne Facility, which would require air district regulatory compliance and fugitive dust control. SDF-AQ-2 is quantified in the construction analysis within CalEEMod where “water three times per day,” “water demolished area,” “water unpaved construction roads,” and “limit vehicle speeds on unpaved roads” were selected to reduce fugitive dust emissions.

Table 3.2-44 presents the estimated maximum daily construction emissions generated during construction of the Tuolumne Facility. “Summer” emissions are representative of the conditions that may occur during the O_3 season (May 1 to October 31), and “winter” emissions are representative of the conditions that may occur during the balance of the year (November 1 to April 30). Details of the emission calculations are provided in Appendix B1.

Table 3.2-44. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Tuolumne Facility - Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025	14.19	159.63	159.29	0.50	29.78	9.93
Winter						
2024	9.37	132.81	94.44	0.41	28.32	10.03

Table 3.2-44. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Tuolumne Facility - Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2025	335.89	164.26	149.50	0.50	29.78	9.93
Maximum	**335.89**	**164.26**	**159.29**	**0.50**	**29.78**	**10.03**
Tuolumne County APCD Daily Threshold	1,000	1,000	1,000	N/A	1,000	N/A
Threshold Exceeded?	**No**	**No**	**No**	**N/A**	**No**	**N/A**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Tuolumne County APCD = Tuolumne County Air Pollution Control District.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).

As shown in Table 3.2-44, construction of the Tuolumne Facility would not exceed the daily Tuolumne County APCD thresholds without mitigation. This impact would be less than significant without mitigation.

Table 3.2-45 presents the estimated annual construction emissions generated during construction of the Tuolumne Facility.

Table 3.2-45. Estimated Annual Construction Criteria Air Pollutant Emissions – Tuolumne Facility - Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2024	0.11	1.48	1.13	<0.01	0.28	0.10
2025	4.42	11.30	12.62	0.03	1.56	0.61
Maximum	**4.42**	**11.30**	**12.62**	**0.03**	**1.56**	**0.61**
Tuolumne County APCD Annual Threshold	100	100	100	N/A	100	N/A
Threshold Exceeded?	**No**	**No**	**No**	**N/A**	**No**	**N/A**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005; N/A = not applicable; Tuolumne County APCD = Tuolumne County Air Pollution Control District.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).

As shown in Table 3.2-45, construction of the Tuolumne Facility would not exceed the annual Tuolumne County APCD thresholds without mitigation.

Construction Ambient Air Quality Analysis

Although the project would not exceed the daily or annual significance thresholds established by the Tuolumne County APCD for any criteria pollutant, the project would emit more than 100 pounds of VOC, NO_x, and CO per day onsite during construction. As recommended by the Guidance for Assessing and Mitigating Air Quality Impacts (San Joaquin Valley APCD 2015a), an ambient air quality impacts assessment should be performed if any pollutants exceed 100 pounds per day during construction or operation. Maximum daily emissions were used as the basis for determining the project's potential impact on ambient air quality. Summary tables of annual and daily emissions associated with construction are included in Appendix B3.

For the initial assessment (Step 1) of the ambient air quality impact analysis, the maximum background concentration for the Tuolumne Facility for each pollutant and averaging period combination was added to the corresponding maximum ground level concentration (GLC) from 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 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 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 this second step, the maximum GLC of each pollutant and averaging period combination were compared to its corresponding SIL. The SIL is used to evaluate whether the 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 GLC did not exceed the corresponding SIL, then the analysis was complete for that source/receptor/pollutant combination, and no further analysis was required. Table 3.2-46 presents a summary of the Air Quality Impact Assessment undertaken to determine whether construction activities associated with the project would cause or contribute to ambient air quality impacts.

As shown in Table 3.2-46, the unmitigated construction emissions would exceed the SILs for the NO_2, PM_{10}, and $PM_{2.5}$ AAQS with incorporation of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton). As such, a Level 2 analysis is required. The Level 2 analysis showed the project would still exceed the AAQS for the 1-hour NO_2, 24-hour and annual PM_{10} and $PM_{2.5}$. This would be a **potentially significant** impact, and therefore, mitigation is required.

MM-AQ-10 (Construction Equipment Exhaust Minimization – Tier 4 Final –Tuolumne Facility) would reduce DPM emissions by requiring Tier 4 Final engines for construction off-road equipment over 50 horsepower at the Tuolumne Facility, which is quantified.

Table 3.2-47 shows the mitigated construction emissions including application of **MM-AQ-2** (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility), **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton), **MM-AQ-4** (Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton), and **MM-AQ-10** (above), with **MM-AQ-10** being quantified.

Table 3.2-46. Tuolumne Facility Construction Ambient Air Quality Analysis - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
Level 1 AAQA									
1-hour CO	State	2.1	2,406	727	3,133	22,900	PASS	2000	Step 1
	Federal	2.1	2,406	727	3,133	40,100	PASS	2000	Step 1
8-hour CO	State	1.5	1,718	413	2,131	10,300	PASS	500	Step 1
	Federal	1.5	1,718	413	2,131	10,300	PASS	500	Step 1
1-hour NO_2	State	0.047	89	523	611	339	Step 2	7.5	**Fail**
	Federal	0.047	88	523	611	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.009	17	79	96	57	Step 2	1	**Fail**
	Federal	0.009	17	79	96	100	PASS	1	Step 1
1-hour SO_2	State	0.008	21	1	22	655	PASS	7.8	Step 1
	Federal	0.008	21	1	22	196	PASS	7.8	Step 1
24-Hour SO_2	State	0.003	8	0	8	105	PASS	5	Step 1
	Federal	0.003	8	0	8	367	PASS	5	Step 1
Annual SO_2	Federal	0.000	1	0	1	79	PASS	1	Step 1
24-hour PM_{10}	State	–	121	56	177	50	Step 2	5	**Fail**
	Federal	–	121	56	177	150	Step 2	5	**Fail**
Annual PM_{10}	State	–	20	18	38	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	94	22	116	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	9	7	16	12	Step 2	0.3	**Fail**
	Federal*	–	9	7	16	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour NO_2	State	0.047	88	504.42	593	339	Step 2	7.5	**Fail**
	Federal	0.047	88	504.42	593	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.009	17	79.03	96	57	Step 2	1	**Fail**
24-hour PM_{10}	State	–	121	55.84	177	50	Step 2	5	**Fail**
	Federal	–	121	55.84	177	150	Step 2	5	**Fail**

Table 3.2-46. Tuolumne Facility Construction Ambient Air Quality Analysis - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
Annual PM_{10}	State					20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	94	16.71	111	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	9	7.14	16	12	Step 2	0.13	**Fail**
	Federal	–	9	7.14	16	9	Step 2	0.13	**Fail**

Source: Appendix B3.

Notes: ppmv = parts per million by volume; μg/m³ = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.

As discussed in Section 3.2.1.4, the closest monitoring station for NO_2, PM_{10}, and $PM_{2.5}$ is 30 miles from the project site because the MCAB is in attainment for these pollutants. Therefore, the background concentrations for PM_{10} used in this AQIA are from a nonattainment area that are not representative of the project site and overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

Table 3.2-47. Tuolumne Facility Construction Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
1-hour CO	State	2.1	2,406	803	3,209	22,900	**PASS**	2000	Step 1
	Federal	2.1	2,406	803	3,209	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	456	2,174	10,300	**PASS**	500	Step 1
	Federal	1.5	1,718	456	2,174	10,300	**PASS**	500	Step 1
1-hour NO_2	State	0.047	89	239	328	339	**PASS**	7.5	Step 1
	Federal	0.047	88	239	328	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.009	17	36	53	57	**PASS**	1	Step 1
	Federal	0.009	17	36	53	100	**PASS**	1	Step 1
1-hour SO_2	State	0.008	21	1	22	655	**PASS**	7.8	Step 1
	Federal	0.008	21	1	22	196	**PASS**	7.8	Step 1
24-Hour SO_2	State	0.003	8	0	8	105	**PASS**	1	Step 1

Table 3.2-47. Tuolumne Facility Construction Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution ($\mu g/m^3$)	Cumulative Concentration ($\mu g/m^3$)	AAQS Threshold ($\mu g/m^3$)	Step 1 Significance	SIL ($\mu g/m^3$)	Step 2 Significance
		ppmv	$\mu g/m^3$						
	Federal	0.003	8	0	8	367	**PASS**	1	Step 1
Annual SO_2	Federal	0.000	1	0	1	79	**PASS**	0	Step 1
24-hour PM_{10}	State	–	121	49	170	50	Step 2	5	**Fail**
	Federal	–	121	49	170	150	Step 2	5	**Fail**
Annual PM_{10}	State	–	20	16	36	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	94	16	110	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	9	5	14	12	Step 2	0.3	**Fail**
	Federal*	–	9	5	14	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour NO_2	Federal	0.047	88	230.86	319	188	Step 2	7.5	**Fail**
24-hour PM_{10}	State	–	121	48.73	170	50	Step 2	5	**Fail**
	Federal	–	121	48.73	170	150	Step 2	5	**Fail**
Annual PM_{10}	State	–	20	15.82	36	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	94	11.79	106	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	9	5.04	14	12	Step 2	0.3	**Fail**
	Federal*	–	9	5.04	14	9	Step 2	0.13	**Fail**

Source: Appendix B3.

Notes: ppmv = parts per million by volume; ug/m^3 = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value. The values shown include quantification of **MM-AQ-10** (Construction Equipment Exhaust Minimization – Tier 4 Final –Tuolumne Facility).

As discussed in Section 3.2.1.4, the closest monitoring station for NO_2, PM_{10}, and $PM_{2.5}$ is 30 miles from the project site because the MCAB is in attainment for these pollutants. Therefore, the background concentrations for PM_{10} used in this AQIA are from a nonattainment area that are not representative of the project site and overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

As demonstrated in Table 3.2-47, construction of the Tuolumne Facility would generate ambient concentrations of criteria pollutants (including NO_2) above the applicable thresholds with application of mitigation. This represents a cumulatively considerable increase in these pollutants. Tuolumne County is federal nonattainment (and California transitional/nonattainment) for O_3, and as set forth in GAMAQI, a cumulatively considerable increase in one or more O_3 precursors (such as NO_2) is considered to result in a cumulatively considerable net increase in O_3. Therefore, the impact related to this portion of the project would be **significant and unavoidable.**

Table 3.2-47 also demonstrates that construction of the Tuolumne Facility would generate ambient concentrations of PM_{10} and $PM_{2.5}$ that exceed applicable thresholds; however, these are not pollutants for which Tuolumne County is in non-attainment. Tuolumne County is designated as attainment or unclassified for PM_{10} and $PM_{2.5}$ under both CAAQS and NAAQS. Specifically, Tuolumne County is designated as unclassified for the PM_{10} CAAQS, attainment for the PM_{10} NAAQS, unclassified for the $PM_{2.5}$ CAAQS, and unclassifiable/attainment for the $PM_{2.5}$ NAAQS.

Operational Emissions

Operation at the Tuolumne Facility would generate VOC, NOx, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from area sources, mobile sources, off-road equipment, stationary equipment, and rail sources. As discussed in Section 3.2.4.1.2, pollutant emissions associated with long-term operations were quantified using CalEEMod using a combination of project-specific information and CalEEMod default values.

Table 3.2-48 presents the estimated unmitigated maximum daily operational emissions for the Tuolumne Facility and anticipated project activities within the Tuolumne County APCD jurisdictional boundaries for summer and winter.

Table 3.2-48. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	7.34	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.73	2.92	20.19	0.05	3.82	1.00
Off-Road Equipment	1.36	12.93	22.66	0.04	0.51	0.47
Stationary Equipment	504.66	373.88	679.85	0.23	399.45	399.12
Logging/Haul Trucks[a]	0.76	49.89	12.48	0.30	13.06	4.21
Rail[b]	0.25	5.82	1.41	0.01	0.13	0.12
Total	**515.10**	**445.44**	**736.59**	**0.63**	**416.97**	**404.92**
Winter						
Area	7.34	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.70	3.50	15.53	0.05	3.82	1.00
Off-Road Equipment	1.36	12.93	22.66	0.04	0.51	0.47
Stationary Equipment	504.66	373.88	679.85	0.23	399.45	399.12

Table 3.2-48. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Logging/Haul Trucks[a]	0.74	52.69	12.57	0.30	13.06	4.21
Rail[b]	0.25	5.82	1.41	0.01	0.13	0.12
Total	*515.05*	*448.82*	*732.02*	*0.63*	*416.97*	*404.92*
Maximum	**515.10**	**448.82**	**736.59**	**0.63**	**416.97**	**404.92**
Tuolumne County APCD Daily Threshold	1,000	1,000	1,000	N/A	1,000	N/A
Threshold Exceeded?	**No**	**No**	**No**	**N/A**	**No**	**N/A**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Tuolumne County APCD = Tuolumne County Air Pollution Control District.

[a] Logging/Haul Trucks emissions include the emissions from all of the Tuolumne logging/haul trucks assuming a 55.7-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Tuolumne County APCD boundaries concurrently.

[b] Rail emissions include the line haul train emissions within the Tuolumne County APCD.

As shown in Table 3.2-48, Tuolumne Facility operations would not exceed the daily Tuolumne County APCD thresholds without mitigation.

Table 3.2-49 presents the estimated mitigated maximum daily operational emissions for the Tuolumne Facility and anticipated project activities within the Tuolumne County APCD jurisdictional boundaries for summer and winter. (As indicated in Table 3.2-48, the unmitigated maximum daily operational emissions for the Tuolumne Facility are less than the applicable thresholds, and this additional data regarding the effects of mitigation is provided for informational purposes.)

Table 3.2-49. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD - Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	7.34	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.73	2.92	20.19	0.05	3.82	1.00
Off-Road Equipment	0.36	1.89	26.10	0.04	0.07	0.07
Stationary Equipment	504.66	373.88	679.85	0.23	399.45	399.12
Logging/Haul Trucks[a]	0.76	49.89	12.48	0.30	13.06	4.21
Rail[b]	0.25	5.82	1.41	0.01	0.13	0.12
Total	**514.10**	**434.40**	**740.03**	**0.63**	**416.53**	**404.52**
Winter						
Area	7.34	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0

Table 3.2-49. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD - Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Mobile	0.70	3.50	15.53	0.05	3.82	1.00
Off-Road Equipment	0.36	1.89	26.10	0.04	0.07	0.07
Stationary Equipment	504.66	373.88	679.85	0.23	399.45	399.12
Logging/Haul Trucks[a]	0.74	52.69	12.57	0.30	13.06	4.21
Rail[b]	0.25	5.82	1.41	0.01	0.13	0.12
Total	*514.05*	*437.78*	*735.46*	*0.63*	*416.53*	*404.52*
Maximum	**515.10**	**437.78**	**740.03**	**0.63**	**416.53**	**404.52**
Tuolumne County APCD Daily Threshold	*1,000*	*1,000*	*1,000*	*N/A*	*1,000*	*N/A*
Threshold Exceeded?	**No**	**No**	**No**	**N/A**	**No**	**N/A**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Tuolumne County APCD = Tuolumne County Air Pollution Control District.

[a] Logging/Haul Trucks emissions include the emissions from all of the Tuolumne logging/haul trucks assuming a 55.7-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Tuolumne County APCD boundaries concurrently.

[b] Rail emissions include the line haul train emissions within the Tuolumne County APCD.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton).

If 100% of feedstock activity and Tuolumne Facility operations (including line haul transport) occur within Tuolumne County APCD jurisdictional boundaries *at the same time*, the combined maximum daily criteria air pollutant emissions from Table 3.2-30 and Table 3.2-48 would be approximately 526 pounds per day of VOC, 720 pounds per day of NO_x, 1,128 pounds per day of CO, 2 pounds per day SO_x, 878 pounds per day of PM_{10}, and 482 pounds per day of $PM_{2.5}$ with incorporation of PDFs and mitigation. (As noted above, this is unlikely in practice; however, more precise determination of the percentage of these activities occurring within Tuolumne County APCD boundaries at any given time is impracticable at this stage, since the location and timing of specific feedstock acquisition and line haul transport activities is not yet known.) Note that these figures do not include application of the Tuolumne Facility operations mitigation measures discussed below, and even under this scenario, the majority of daily feedstock and rail-related emissions would not occur in the immediate vicinity of the Facility site.

Table 3.2-50 presents the estimated unmitigated annual operational emissions for the Tuolumne Facility and anticipated project activities within the Tuolumne County APCD jurisdictional boundaries.

Table 3.2-50. Estimated Annual Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	1.34	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.13	0.60	2.93	0.01	0.68	0.18

Table 3.2-50. Estimated Annual Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Off-Road Equipment	0.23	2.17	3.80	0.01	0.08	0.08
Stationary Equipment	84.53	62.63	113.88	0.04	66.91	66.85
Logging/Haul Trucks[a]	0.07	5.12	1.22	0.03	1.25	0.40
Rail[b]	0.03	0.70	0.17	0.00	0.02	0.01
Total	**86.33**	**71.22**	**122.00**	**0.09**	**68.94**	**67.52**
Tuolumne County APCD Annual Threshold	100	100	100	N/A	100	N/A
Threshold Exceeded?	**No**	**No**	**Yes**	**N/A**	**No**	**N/A**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; Tuolumne County APCD = Tuolumne County Air Pollution Control District.

a Logging/Haul Trucks emissions include the emissions from all of the Tuolumne logging/haul trucks assuming a 55.7-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Tuolumne County APCD boundaries concurrently.

b Rail emissions include the line haul train emissions within the Tuolumne County APCD.

As shown in Table 3.2-50, the project would exceed the annual Tuolumne County APCD thresholds for CO prior to mitigation. This impact would be **potentially significant** prior to mitigation.

Mitigation measures identified to reduce project-generated emissions and environmental impacts during construction of the Lassen Facility include **MM-AQ-2** through **MM-AQ-4**, and **MM-AQ-8** as follows.

MM-AQ-2 (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility), **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton), and **MM-AQ-4** (Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce impacts during operation at the Tuolumne Facility, which are not quantified. **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce criteria air pollutant emissions, specifically VOC, NO_X, PM_{10}, and $PM_{2.5}$, by requiring the project to minimize operational off-road equipment exhaust with Tier 4 Final equipment, which is quantified.

Table 3.2-51 presents the estimated mitigated annual operational emissions for the Tuolumne facility and anticipated project activities within the Tuolumne County APCD jurisdictional boundaries.

Table 3.2-51. Estimated Annual Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	1.34	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.13	0.60	2.93	0.01	0.68	0.18

Table 3.2-51. Estimated Annual Operation Criteria Air Pollutant Emissions – Tuolumne Facility and Project Activities within Tuolumne County APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Off-Road Equipment	0.06	0.32	4.37	0.01	0.01	0.01
Stationary Sources	84.53	62.63	113.88	0.04	66.91	66.85
Logging/Haul Trucks[a]	0.07	5.12	1.22	0.03	1.25	0.40
Rail[b]	0.03	0.70	0.17	0.00	0.02	0.01
Total	*86.16*	*69.37*	*122.57*	*0.09*	*68.87*	*67.45*
Tuolumne County APCD Annual Threshold	100	100	100	N/A	100	N/A
Threshold Exceeded?	**No**	**No**	**Yes**	**N/A**	**No**	**N/A**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; <0.01 = value is less than 0.005; Tuolumne County APCD = Tuolumne County Air Pollution Control District.

a Logging/Haul Trucks emissions include the emissions from all of the Tuolumne logging/haul trucks assuming a 55.7-mile one-way trip length. This assumption is conservative because it is unlikely that all logging/haul trucks would be traveling within the Tuolumne County APCD boundaries concurrently.

b Rail emissions include the line haul train emissions within the Tuolumne County APCD.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton).

As shown in Table 3.2-51, the project would exceed the annual Tuolumne County APCD threshold for CO with incorporation of mitigation.

Pellet storage at the Tuolumne Facility would result in negligible emissions of VOC from woody biomass decomposition. However, VOC concentrations associated with storage of wood pellets are very low, especially at shorter storage durations. More VOCs are emitted from stored sawdust and wood chips compared to stored wood pellets (Yazdanpanah et al. 2014). However, the project's intent is to convert all useable woody biomass into pellets and the remainder into dryer fuel, rather than disposal or long-term storage. Due to these factors, additional VOC emissions from pellet storage would be negligible.

Operational Ambient Air Quality Analysis

The project would exceed the annual significance threshold established by the Tuolumne County APCD for CO with the inclusion of mitigation, and the project would emit more than 100 pounds of VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$ per day onsite during operation. As recommended by the Guidance for Assessing and Mitigating Air Quality Impacts (San Joaquin Valley APCD 2015a), an ambient air quality impacts assessment should be performed if any pollutants exceed 100 pounds per day during construction or operation. Maximum daily emissions were used as the basis for determining the project's potential impact on ambient air quality. Summary tables of annual and daily emissions associated with operation are included in Appendix B3.

For the initial assessment (Step 1) of the ambient air quality impact analysis, the maximum background concentration for the Tuolumne Facility for each pollutant and averaging period combination was added to the corresponding maximum ground level concentration (GLC) from 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 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 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 this second step, the maximum GLC of each pollutant and averaging period combination were compared to its corresponding SIL. The SIL is used to evaluate whether the 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 GLC did not exceed the corresponding SIL, then the analysis was complete for that source/receptor/pollutant combination, and no further analysis was required. Table 3.2-52 presents a summary of the Air Quality Impact Assessment undertaken to determine whether construction activities associated with the project would cause or contribute to ambient air quality impacts.

As shown in Table 3.2-52, the unmitigated operational emissions would exceed the SILs for the CO, NO_2, PM_{10}, and $PM_{2.5}$ AAQS. As such, a Level 2 analysis is required. The Level 2 analysis showed the project would still exceed the AAQS for the 1-hour NO_2 and 24-hour and annual PM_{10} and $PM_{2.5}$. This would be a **potentially significant** impact, and therefore, mitigation is required.

Table 3.2-53 shows the mitigated construction emissions including application of **MM-AQ-2**, **MM-AQ-3**, **MM-AQ-4**, and **MM-AQ-8**, with **MM-AQ-8** being quantified. These mitigation measures are listed as follows:

- **MM-AQ-2: Construction and Operation Limit Truck and Equipment Idling –** Feedstock Acquisition, Lassen Facility, and Tuolumne Facility
- **MM-AQ-3: Construction and Operation Renewable Diesel Fuel –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-4: Construction and Operational Worker Commute Optimization –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-8: Operational Equipment Exhaust Minimization –** Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton

As demonstrated in Table 3.2-53, operational activities at the Tuolumne Facility would generate ambient concentrations of criteria pollutants (including NO_2) above the applicable thresholds with application of mitigation. This represents a cumulatively considerable increase in these pollutants. Tuolumne County is federal nonattainment (and California transitional/nonattainment) for O_3, and as set forth in GAMAQI, a cumulatively considerable increase in one or more O_3 precursors (such as NO_2) is considered to result in a cumulatively considerable net increase in O_3. Therefore, the impact related to this portion of the project would be **significant and unavoidable.**

Table 3.2-53 also demonstrates that the project's Tuolumne Facility operation would generate ambient concentrations of PM_{10} and $PM_{2.5}$ that exceed applicable thresholds; however, these are not pollutants for which Tuolumne County is in non-attainment. Tuolumne County is designated as attainment or unclassified for PM_{10} and $PM_{2.5}$ under both CAAQS and NAAQS. Specifically, Tuolumne County is designated as unclassified for the PM_{10} CAAQS, attainment for the PM_{10} NAAQS, unclassified the$PM_{2.5}$ CAAQS, and unclassifiable/attainment for the $PM_{2.5}$ NAAQS.

Table 3.2-52. Tuolumne Facility Operational Ambient Air Quality Analysis - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
Level 1 AAQA									
1-hour CO	State	2.1	2,406	26,325	28,731	22,900	Step 2	2000	**Fail**
	Federal	2.1	2,406	26,325	28,731	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	14,450	16,168	10,300	Step 2	500	**Fail**
	Federal	1.5	1,718	14,450	16,168	10,300	Step 2	500	**Fail**
1-hour NO_2	State	0.047	89	11,675	11,764	339	Step 2	7.5	**Fail**
	Federal	0.047	88	11,675	11,764	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.009	17	1,510	1,527	57	Step 2	1	**Fail**
	Federal	0.009	17	1,510	1,527	100	Step 2	1	**Fail**
1-hour SO_2	State	0.008	21	11	32	655	**PASS**	7.8	Step 1
	Federal	0.008	21	11	32	196	**PASS**	7.8	Step 1
24-Hour SO_2	State	0.003	8	4	12	105	**PASS**	5	Step 1
	Federal	0.003	8	4	12	367	**PASS**	5	Step 1
Annual SO_2	Federal	0.000	1	1	2	79	**PASS**	1	Step 1
24-hour PM_{10}	State	–	121	4,861	4,983	50	Step 2	5	**Fail**
	Federal	–	121	4,861	4,983	150	Step 2	5	**Fail**
Annual PM_{10}	State	–	20	1,536	1,556	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	94	4,856	4,950	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	9	1,534	1,543	12	Step 2	0.3	**Fail**
	Federal*	–	9	1,534	1,543	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour CO	State	2.1	2,406	150.18	2,556	22,900	**PASS**	2000	Step 1
	Federal	2.1	2,406	150.18	2,556	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	100.01	1,818	10,300	**PASS**	500	Step 1
	Federal	1.5	1,718	100.01	1,818	10,300	**PASS**	500	Step 1

Table 3.2-52. Tuolumne Facility Operational Ambient Air Quality Analysis - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m³						
1-hour NO_2	State	0.047	89	110.07	199	339	**PASS**	7.5	Step 1
	Federal	0.047	88	110.07	198	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.009	17	15.37	32	57	**PASS**	1	Step 1
	Federal	0.009	17	15.37	32	100	**PASS**	1	Step 1
24-hour PM_{10}	State	–	121	97.72	219	50	Step 2	5	**Fail**
	Federal	–	121	97.72	219	150	Step 2	5	**Fail**
Annual PM_{10}	State	–	20	26.57	46	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	94	63.53	158	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	9	26.54	35	12	Step 2	0.3	**Fail**
	Federal*	–	9	26.54	35	9	Step 2	0.13	**Fail**

Source: Appendix B3.

Notes: ppmv = parts per million by volume; µg/m³ = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.

As previously discussed, the background concentrations used in this AQIA are from nonattainment areas that are not representative of the project site and overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

Table 3.2-53. Tuolumne Facility Operational Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m³						
Level 1									
1-hour CO	State	2.1	2,406	26,464	28,870	22,900	Step 2	2000	**Fail**
	Federal	2.1	2,406	26,464	28,870	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	14,526	16,245	10,300	Step 2	500	**Fail**

Table 3.2-53. Tuolumne Facility Operational Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
	Federal	1.5	1,718	14,526	16,245	10,300	Step 2	500	**Fail**
1-hour NO_2	State	0.047	89	11,318	11,407	339	Step 2	7.5	**Fail**
	Federal	0.047	88	11,318	11,407	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.009	17	1,464	1,481	57	Step 2	1	**Fail**
	Federal	0.009	17	1,464	1,481	100	Step 2	1	**Fail**
1-hour SO_2	State	0.008	21	11	32	655	**PASS**	7.8	Step 1
	Federal	0.008	21	11	32	196	**PASS**	7.8	Step 1
24-Hour SO_2	State	0.003	8	4	12	105	**PASS**	1	Step 1
	Federal	0.003	8	4	12	367	**PASS**	1	Step 1
Annual SO_2	Federal	0.000	1	1	2	79	**PASS**	0	Step 1
24-hour PM_{10}	State	–	121	4,856	4,977	50	Step 2	5	**Fail**
	Federal	–	121	4,856	4,977	150	Step 2	5	**Fail**
Annual PM_{10}	State	–	20	1,534	1,554	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	94	4,851	4,945	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	9	1,533	1,541	12	Step 2	0.3	**Fail**
	Federal*	–	9	1,533	1,541	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour CO	State	2.1	2,406	157.77	2,564	22,900	**PASS**	2000	Step 1
	Federal	2.1	2,406	157.77	2,564	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.5	1,718	92.18	1,811	10,300	**PASS**	500	Step 1
	Federal	1.5	1,718	92.18	1,811	10,300	**PASS**	500	Step 1
1-hour NO_2	State	0.047	89	132.67	221	339	**PASS**	7.5	Step 1
	Federal	0.047	88	132.67	221	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.009	17	14.04	31	57	**PASS**	1	Step 1
	Federal	0.009	17	14.04	31	100	**PASS**	1	Step 1

Table 3.2-53. Tuolumne Facility Operational Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m^3						
24-hour PM_{10}	State	--	121	97.66	219	50	Step 2	5	**Fail**
	Federal	--	121	97.66	219	150	Step 2	5	**Fail**
Annual PM_{10}	State	--	20	26.52	46	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	--	94	63.48	158	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	--	9	26.50	35	12	Step 2	0.3	**Fail**
	Federal*	--	9	26.50	35	9	Step 2	0.13	**Fail**

Source: Appendix B3.
Notes: ppmv = parts per million by volume; ug/m^3 = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.
The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton).
As previously discussed, the background concentrations used in this AQIA are from nonattainment areas that are not representative of the project site and overestimate the background concentrations where the facility is located. Therefore, results presented herein are considered conservative.

Tuolumne Facility - Conclusion

Overall, emissions from criteria pollutants during construction would not exceed the Tuolumne County APCD significance thresholds with implementation of SDF-AQ-1 and SDF-AQ-2 (Tables 3.2-44 and 3.2-45), but would generate ambient concentrations of criteria pollutants (including NO_2) above the applicable thresholds with application of mitigation (Table 3.2-47). Additionally, as shown in Table 3.2-49, operational emissions at the Tuolumne Facility would have the potential to exceed the annual threshold for CO prior to mitigation, and the impact would be potentially significant. After implementation of **MM-AQ-2** through **MM-AQ-4**, **MM-AQ-7** through **MM-AQ-8**, and **MM-AQ-10**, and as shown in Table 3.2-50, the operational emissions at the Tuolumne Facility would still exceed the annual threshold for CO. Further, as demonstrated in Table 3.2-53, the project would result in operational activities that would generate ambient concentrations of criteria pollutants (including NO_2) above the applicable thresholds with application of mitigation. This represents a cumulatively considerable increase in these pollutants. Tuolumne County is federal nonattainment (and California transitional/nonattainment) for O_3, and as set forth in GAMAQI, a cumulatively considerable increase in one or more O_3 precursors (such as NO_2) is considered to result in a cumulatively considerable net increase in O_3. Therefore, the impact related to this portion of the project would be **significant and unavoidable.**

Transport to Market

Rail Transport

Rail transport would generate criteria air pollutants. As discussed in Section 3.2.4.1.3, pollutant emissions associated with long-term operations were quantified using a spreadsheet model.

Table 3.2-54 presents the estimated maximum daily criteria air pollutant emissions from line haul rail travel from the Lassen Facility and the Tuolumne Facility to the Port of Stockton in each respective air district.

Table 3.2-54. Estimated Maximum Daily Criteria Air Pollutant Emissions – Line Haul - Unmitigated

Scenario	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Total Emissions by Air District						
Lassen County APCD	18.04	426.54	103.11	0.40	9.74	8.96
Northern Sierra AQMD	16.40	387.83	93.75	0.37	8.86	8.15
Butte County AQMD	11.77	278.41	67.30	0.26	6.36	5.85
Feather River AQMD	9.53	225.40	54.49	0.21	5.15	4.73
Sacramento Metropolitan AQMD	7.83	185.15	44.76	0.17	4.23	3.89
Tuolumne County APCD	0.25	5.82	1.41	0.01	0.13	0.12
San Joaquin Valley APCD	7.74	182.96	44.23	0.17	4.18	3.84
Maximum Day Emissions	**70.48**	**1,666.81**	**402.92**	**1.57**	**38.06**	**35.01**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; <0.01 = value is less than 0.005; APCD = Air Pollution Control District; AQMD = Air Quality Management District.

As shown in Table 3.2-7, Northern Sierra AQMD has a NO_X threshold of 136 pounds per day, Butte County AQMD and Feather River AQMD both have a daily NO_X threshold of 25 pounds per day, and Sacramento Metropolitan

AQMD has a daily NO_X threshold of 65 pounds per day. As shown in Table 3.2-54, line haul emissions would exceed the Northern Sierra AQMD, Butte County AQMD, Feather River AQMD and Sacramento Metropolitan AQMD daily thresholds for NO_X, resulting in a **potentially significant impact.** The line haul emissions are the project's only source of emissions in these air districts. Line haul emissions would not exceed any other annual air district thresholds for any other criteria air pollutant.

Table 3.2-55 presents the estimated total annual criteria air pollutant emissions from line haul rail travel from the Lassen Facility and the Tuolumne Facility to the Port of Stockton in each respective air district.

Table 3.2-55. Estimated Annual Criteria Air Pollutant Emissions – Line Haul - Unmitigated

Scenario	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Total Emissions by Air District						
Lassen County APCD	0.63	14.93	3.61	0.01	0.34	0.31
Northern Sierra AQMD	0.57	13.57	3.28	0.01	0.31	0.29
Butte County AQMD	0.41	9.74	2.36	0.01	0.22	0.20
Feather River AQMD	0.33	7.89	1.91	0.01	0.18	0.17
Sacramento Metropolitan AQMD	0.27	6.48	1.57	0.01	0.15	0.14
Tuolumne County APCD	0.03	0.70	0.17	0.00	0.02	0.01
San Joaquin Valley APCD	0.39	9.24	2.23	0.01	0.21	0.19
Total Annual Emissions	**2.61**	**61.67**	**14.91**	**0.06**	**1.41**	**1.30**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; <0.01 = value is less than 0.005; APCD = Air Pollution Control District; AQMD = Air Quality Management District.

As shown in Table 3.2-7, Butte County AQMD and Feather River AQMD both have an annual NO_X threshold of 4.5 tons per year. As shown in Table 3.2-55, line haul emissions would exceed the Butte County AQMD and Feather River AQMD annual thresholds for NO_X, resulting in a **potentially significant impact.** The line haul emissions are the project's only source of emissions in these air districts. Line haul emissions would not exceed any other annual air district thresholds for any other criteria air pollutant.

The line haul emissions within Lassen County APCD and Tuolumne County APCD jurisdictions have been evaluated against their respective thresholds earlier in this section (See Tables 3.2-40, 3.2-41, and 3.2-50). The line haul emissions within the San Joaquin Valley APCD jurisdiction are evaluated against the San Joaquin Valley APCD thresholds below in Table 3.2-60.

Potential mitigation measures were evaluated to attempt to decrease NO_X emissions below the thresholds that were exceeded; however, GSNR does not have operational control over the line haul trains being used. Therefore, no feasible mitigation measures were identified.

As shown in Tables 3.2-54 and 3.2-55, line haul rail transport emissions would exceed the Northern Sierra AQMD, Butte County AQMD, Feather River AQMD and Sacramento Metropolitan AQMD daily thresholds for NO_X, and the Butte County AQMD and Feather River AQMD annual thresholds for NO_X, and there is no feasible mitigation. (Rail operations occurring with the Lassen APCD, Tuolumne APCD, and San Joaquin Valley APCD are included in the evaluation of those respective Lassen, Tuolumne, and Port of Stockton facilities, respectively.) Several of the counties in which these emissions will occur, including Butte and Sacramento, are nonattainment for O_3, to which NO_x is a precursor (see Table 3.2-1). Since this represents a cumulatively considerable net increase within counties that are nonattainment for O_3, the impact related to this portion of the project would be **significant and unavoidable.**

Port of Stockton

Construction Emissions

Proposed construction activities 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 VOC off-gassing) and off-site sources (i.e., on-road vendor trucks and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity; the specific type of operation; and, for particulate matter, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated.

CalEEMod Version 2022.1.1.25 was used to estimate emissions from construction of the project. Internal combustion engines used by construction equipment, trucks, and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions would also be generated by entrained dust, which results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil. The project would be required to comply with San Joaquin Valley APCD Regulation VIII (Fugitive PM_{10} Prohibition) by law, which specifies standard construction practices to reduce fugitive dust emissions. As described in Section 3.2.4.1.2, the project would implement SDF-AQ-1 (Air District Regulatory Compliance – Lassen Facility, Tuolumne Facility, and Port of Stockton) and SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton) at the Port of Stockton, which would require air district regulatory compliance and fugitive dust control. SDF-AQ-2 is quantified in the construction analysis within CalEEMod where "water three times per day," "water demolished area," "water unpaved construction roads," and "limit vehicle speeds on unpaved roads" were selected to reduce fugitive dust emissions.

Table 3.2-56 presents the estimated annual construction emissions generated during construction of the Port of Stockton. Details of the emission calculations are provided in Appendix B1.

Table 3.2-56. Estimated Annual Construction Criteria Air Pollutant Emissions – Port of Stockton - Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2024	0.08	0.76	0.86	<0.01	0.13	0.07
2025	1.28	9.52	10.21	0.02	0.57	0.42
Maximum	**1.28**	**9.52**	**10.21**	**0.02**	**0.57**	**0.42**
San Joaquin Valley APCD Annual Threshold	10	10	100	27	15	15
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005; San Joaquin Valley APCD = San Joaquin Valley Air Pollution Control District.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).

As shown in Table 3.2-56, emissions of VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions during construction would not exceed the San Joaquin Valley APCD annual significance thresholds Therefore, construction emissions related to the Port of Stockton facility would be **less than significant** without mitigation.

The San Joaquin Valley APCD has not established daily thresholds for criteria air pollutants. However, Table 3.2-57 presents the estimated unmitigated daily construction emissions for the Port of Stockton for informational purposes.

Table 3.2-57. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Port of Stockton - Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2025	9.69	82.83	88.53	0.18	5.33	3.89
Winter						
2024	3.72	36.18	33.79	0.05	6.89	4.14
2025	24.80	90.58	98.77	0.19	5.85	4.26
Maximum	**24.80**	**90.58**	**98.77**	**0.19**	**6.89**	**4.26**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.
The values shown include quantification of SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton).

As shown in Table 3.2-57, construction of the Port of Stockton would result in criteria air pollutant emissions that are less than the 100 pounds per day threshold for preparing an AAQA.

Operational Emissions

Operation at the Port of Stockton would generate VOC, NOx, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from area sources, mobile sources, off-road equipment, permitted sources, rail sources, and marine sources. As discussed in Section 3.2.4.1.3, pollutant emissions associated with long-term operations were quantified using CalEEMod using a combination of project-specific information and CalEEMod default values.

Table 3.2-58 presents the estimated unmitigated annual operational emissions associated with the Port of Stockton and anticipated project activities within the San Joaquin Valley APCD jurisdictional boundaries.

Table 3.2-58. Estimated Annual Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	0.30	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.01	0.06	0.11	<0.01	0.04	0.01
Off-Road Equipment	0.04	0.46	0.50	<0.01	0.01	0.01
Stationary Equipment[a]	0.01	0.16	0.03	0.01	0.91	0.91

Table 3.2-58. Estimated Annual Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Ships[b]	0.65	14.32	1.59	0.67	0.36	0.28
Rail[c]	0.39	9.24	2.23	0.01	0.21	0.19
Switcher[d]	0.03	0.50	0.15	0.00	0.02	0.02
Total	**1.43**	**24.74**	**4.61**	**0.69**	**1.54**	**1.42**
San Joaquin Valley APCD Annual Threshold	10	10	100	27	15	15
Threshold Exceeded?	**No**	**Yes**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005; San Joaquin Valley APCD = San Joaquin Valley Air Pollution Control District.

a Stationary equipment includes the emissions from pellet storage and fire pumps.

b Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the San Joaquin Valley APCD.

c Rail includes the line haul train emissions within the San Joaquin Valley APCD.

d The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

As shown in Table 3.2-58, project operations would exceed San Joaquin Valley APCD annual thresholds for NO_X. This impact would be **potentially significant** prior to mitigation.

The San Joaquin Valley APCD has not established daily thresholds for criteria air pollutants. However, Table 3.2-59 presents the estimated unmitigated daily operational emissions for the Port of Stockton and anticipated project activities within the San Joaquin County APCD jurisdictional boundaries for informational purposes.

Table 3.2-59. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.05	0.29	0.75	<0.01	0.21	0.06
Off-Road Equipment	0.82	9.26	9.94	0.03	0.27	0.25
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	22.31	493.88	54.82	23.24	11.64	9.55
Rail[c]	7.74	182.96	44.23	0.17	4.18	3.84
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**33.04**	**693.67**	**111.88**	**23.51**	**21.52**	**18.92**
Winter						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.05	0.31	0.60	<0.01	0.21	0.06

Table 3.2-59. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Off-Road Equipment	0.82	9.26	9.94	0.03	0.27	0.25
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	22.31	493.88	54.82	23.24	11.64	9.55
Rail[c]	7.74	182.96	44.23	0.17	4.18	3.84
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**33.04**	**693.69**	**111.73**	**23.51**	**21.52**	**18.92**
Maximum	**33.04**	**693.69**	**111.88**	**23.51**	**21.52**	**18.92**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

[a] Stationary equipment includes the emissions from pellet storage and fire pumps.

[b] Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the San Joaquin Valley APCD.

[c] Rail includes the line haul train emissions within the San Joaquin Valley APCD.

[d] The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

Mitigation measures identified to reduce project-generated emissions and environmental impacts during operation at the Port of Stockton include **MM-AQ-3**, **MM-AQ-4**, **MM-AQ-7**, **MM-AQ-8**, and **MM-AQ-11** as follows.

MM-AQ-8 (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) would further reduce criteria air pollutant emissions, which is quantified. In addition, **MM-AQ-11** (Operational Switcher Exhaust Minimization – Port of Stockton) would reduce criteria air pollutant emissions by requiring a Tier 4 Final engine for the on-site switcher at the Port of Stockton, which is quantified.

Furthermore, **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton), **MM-AQ-4** (Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton), and **MM-AQ-7** (Construction Activities Notification -- Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce impacts during operation at the Port of Stockton.

Table 3.2-60 presents the estimated mitigated annual operational emissions at the Port of Stockton and anticipated project activities within San Joaquin Valley APCD jurisdictional boundaries.

Table 3.2-60. Estimated Annual Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	0.30	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.01	0.06	0.11	<0.01	0.04	0.01
Off-Road Equipment	0.01	0.08	0.85	<0.01	<0.01	<0.01
Stationary Equipment[a]	0.01	0.16	0.03	0.01	0.91	0.91

Table 3.2-60. Estimated Annual Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Ships[b]	0.65	14.32	1.59	0.67	0.36	0.28
Rail[c]	0.39	9.24	2.23	0.01	0.21	0.19
Switcher[d]	0.03	0.50	0.15	0.00	0.02	0.02
Total	**1.40**	**24.36**	**4.96**	**0.69**	**1.53**	**1.41**
San Joaquin Valley APCD Annual Threshold	10	10	100	27	15	15
Threshold Exceeded?	**No**	**Yes**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005; San Joaquin Valley APCD = San Joaquin Valley Air Pollution Control District.

a Stationary equipment includes the emissions from pellet storage and fire pumps.

b Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the San Joaquin Valley APCD.

c Rail includes the line haul train emissions within the San Joaquin Valley APCD.

d The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-11** (Operational Switcher Exhaust Minimization – Port of Stockton).

As shown in Table 3.2-60, the project operations would exceed San Joaquin Valley APCD annual thresholds for NO_X after incorporation of mitigation measures.

The San Joaquin Valley APCD has not established daily thresholds for criteria air pollutants. However, Table 3.2-61 presents the estimated mitigated daily operational emissions for the Port of Stockton and anticipated project activities within San Joaquin Valley APCD jurisdictional boundaries for informational purposes.

Table 3.2-61. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	0.05	0.29	0.75	<0.01	0.21	0.06
Off-Road Equipment	0.29	1.53	17.09	0.03	0.06	0.06
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	22.31	493.88	54.82	23.24	11.64	9.55
Rail[c]	7.74	182.96	44.23	0.17	4.18	3.84
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**32.51**	**685.94**	**119.03**	**23.51**	**19.80**	**18.50**
Winter						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0

Table 3.2-61. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Port of Stockton and Project Activities within San Joaquin Valley APCD – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Mobile	0.05	0.31	0.60	<0.01	0.21	0.06
Off-Road Equipment	0.29	1.53	17.09	0.03	0.06	0.06
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	22.31	493.88	54.82	23.24	11.64	9.55
Rail[c]	7.74	182.96	44.23	0.17	4.18	3.84
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**32.51**	**685.96**	**118.88**	**23.51**	**19.80**	**18.50**
Maximum	**32.51**	**685.96**	**119.03**	**23.51**	**19.80**	**18.50**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

[a] Stationary equipment includes the emissions from pellet storage and fire pumps.

[b] Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the San Joaquin Valley APCD.

[c] Rail includes the line haul train emissions within the San Joaquin Valley APCD.

[d] The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-11** (Operational Switcher Exhaust Minimization – Port of Stockton).

If 100% of feedstock activity and Port of Stockton facility operations (including line haul transport, and ship transport) occur within San Joaquin Valley APCD jurisdictional boundaries *at the same time*, the combined maximum daily air pollutant emissions from Table 3.2-30 and Table 3.2-61 would be approximately 43 pounds per day of VOC, 953 pounds per day of NO_x, 510 pounds per day of CO, 25 pounds per day of SO_X, 481 pounds per day of PM_{10}, and 96 pounds per day of $PM_{2.5}$ with incorporation of PDFs and mitigation. (As noted above, this is unlikely in practice; however, more precise determination of the percentage of these activities occurring within San Joaquin Valley APCD boundaries at any given time is impracticable at this stage, since the location and timing of specific feedstock acquisition and line haul transport activities is not yet known.) Note that even under this scenario, the majority of daily feedstock, ship, and rail-related emissions would not occur in the immediate vicinity of the Facility site.

Pellet storage at the Port of Stockton would result in negligible emissions of VOC from woody biomass decomposition. However, VOC concentrations associated with storage of wood pellets are very low, especially at shorter storage durations. More VOCs are emitted from stored sawdust and wood chips compared to stored wood pellets (Yazdanpanah et al. 2014). The Port of Stockton would store finished pellets only, and therefore, additional VOC emissions from pellet storage would be negligible.

Operational Ambient Air Quality Analysis

The project would exceed the annual significance threshold established by the San Joaquin Valley APCD for NO_X with the inclusion of mitigation, and the Port of Stockton facility would cause the emission of more than 100 pounds each of NO_X and CO per day onsite during operation. As recommended by the Guidance for Assessing and Mitigating Air Quality Impacts (San Joaquin Valley APCD 2015a), an ambient air quality impacts assessment should be performed if any pollutants exceed 100 pounds per day during construction or operation. Maximum daily emissions were used as the basis for determining the project's potential impact on ambient air quality. Summary tables of annual and daily emissions associated with operation are included in Appendix B3.

For the initial assessment (Step 1) of the ambient air quality impact analysis, the maximum background concentration for the Port for each pollutant and averaging period combination was added to the corresponding maximum ground level concentration (GLC) from 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 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 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 this second step, the maximum GLC of each pollutant and averaging period combination were compared to its corresponding SIL. The SIL is used to evaluate whether the 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 GLC did not exceed the corresponding SIL, then the analysis was complete for that source/receptor/pollutant combination, and no further analysis was required. Table 3.2-62 presents a summary of the Air Quality Impact Assessment undertaken to determine whether construction activities associated with the project would cause or contribute to ambient air quality impacts.

As shown in Table 3.2-62, the unmitigated operational emissions would exceed the SILs for the NO_2, SO_2, PM_{10}, and $PM_{2.5}$ AAQS. As such, a Level 2 analysis is required. The Level 2 analysis showed the project would still exceed the AAQS for the annual $PM_{2.5}$. This would be a **potentially significant** impact, and therefore,, mitigation is required. Table 3.2-63 shows the mitigated construction emissions including application of **MM-AQ-3**, **MM-AQ-4**, **MM-AQ-8**, and **MM-AQ-11**, with **MM-AQ-8** and **MM-AQ-11** being quantified. These mitigation measures are listed as follows:

- **MM-AQ-3: Construction and Operation Renewable Diesel Fuel –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-4: Construction and Operational Worker Commute Optimization –** Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-8: Operational Equipment Exhaust Minimization –** Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton
- **MM-AQ-11: Operational Switcher Exhaust Minimization –** Port of Stockton

As demonstrated in Table 3.2-63, the project would result in operational activities that would generate ambient concentrations of criteria pollutant above the applicable thresholds with application of mitigation.

Table 3.2-62. Transport to Market Operational Ambient Air Quality Analysis - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
Level 1 AAQA									
1-hour CO	State	2.6	2,979	945.48	3,924	22,900	**PASS**	2000	Step 1
	Federal	2.6	2,979	945.48	3,924	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.7	1,948	359.90	2,307	10,300	**PASS**	500	Step 1
	Federal	1.7	1,948	359.90	2,307	10,300	**PASS**	500	Step 1
1-hour NO_2	State	0.045	85	5,993.37	6,078	339	Step 2	7.5	**Fail**
	Federal	0.045	85	5,993.37	6,078	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.008	15	407.13	422	57	Step 2	1	**Fail**
	Federal	0.008	15	407.13	422	100	Step 2	1	**Fail**
1-hour SO_2	State	0.009	24	365.96	390	655	**PASS**	7.8	Step 1
	Federal	0.009	24	365.96	389	196	Step 2	7.8	**Fail**
24-Hour SO_2	State	0.004	11	82.88	93	105	**PASS**	5	Step 1
	Federal	0.004	10	82.88	93	367	**PASS**	5	Step 1
Annual SO_2	Federal	0.001	3	19.89	23	79	**PASS**	1	Step 1
24-hour PM_{10}	State	–	82	58.75	140	50	Step 2	5	**Fail**
	Federal	–	82	58.75	140	150	**PASS**	5	**Fail**
Annual PM_{10}	State	–	26	14.10	40	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	52	55.86	108	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	11	13.40	24	12	Step 2	0.3	**Fail**
	Federal*	–	11	13.40	24	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour NO_2	State	0.045	85	26.39	111	339	**PASS**	7.5	Step 1
	Federal	0.045	85	26.39	111	188	**PASS**	7.5	Step 1
Annual NO_2	State	0.008	15	3.08	18	57	**PASS**	1	Step 1
	Federal	0.008	15	3.08	18	100	**PASS**	1	Step 1

Table 3.2-62. Transport to Market Operational Ambient Air Quality Analysis - Unmitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
1-hour SO_2	Federal	0.009	24	1.26	25	196	**PASS**	7.8	Step 1
24-hour PM_{10}	State	–	82	1.71	83	50	Step 2	5	**PASS**
	Federal	–	82	1.71	83	150	**PASS**	5	Step 1
Annual PM_{10}	State	–	26	0.40	27	20	Step 2	1	**PASS**
24-hour $PM_{2.5}$	Federal	–	52	1.08	53	35	Step 2	1.2	**PASS**
Annual $PM_{2.5}$	State	–	11	0.39	11	12	**PASS**	0.3	Step 1
	Federal*	–	11	0.39	11	9	Step 2	0.3	**Fail**

Source: Appendix B3.
Notes: ppmv = parts per million by volume; μg/m³ = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.

Table 3.2-63. Transport to Market Operational Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (μg/m3)	Cumulative Concentration (μg/m3)	AAQS Threshold (μg/m3)	Step 1 Significance	SIL (μg/m3)	Step 2 Significance
		ppmv	μg/m³						
Level 1									
1-hour CO	State	2.6	2,979	1,087.48	4,066	22,900	**PASS**	2000	Step 1
	Federal	2.6	2,979	1,087.48	4,066	40,100	**PASS**	2000	Step 1
8-hour CO	State	1.7	1,948	413.96	2,361	10,300	**PASS**	500	Step 1
	Federal	1.7	1,948	413.96	2,361	10,300	**PASS**	500	Step 1
1-hour NO_2	State	0.045	85	5,870.56	5,955	339	Step 2	7.5	**Fail**
	Federal	0.045	85	5,870.56	5,955	188	Step 2	7.5	**Fail**
Annual NO_2	State	0.008	15	398.79	414	57	Step 2	1	**Fail**

Table 3.2-63. Transport to Market Operational Air Quality Impact Assessment - Mitigated

Impact Parameter	Applicable Standard	Project Area Maximum Background Concentration (Years 2020–2022)		Project Contribution (µg/m3)	Cumulative Concentration (µg/m3)	AAQS Threshold (µg/m3)	Step 1 Significance	SIL (µg/m3)	Step 2 Significance
		ppmv	µg/m3						
	Federal	0.008	15	398.79	414	100	Step 2	1	**Fail**
1-hour SO_2	State	0.009	24	365.96	390	655	**PASS**	7.8	Step 1
	Federal	0.009	24	365.96	389	196	Step 2	7.8	**Fail**
24-Hour SO_2	State	0.004	11	82.88	93	105	**PASS**	5	Step 1
	Federal	0.004	10	82.88	93	367	**PASS**	5	Step 1
Annual SO_2	Federal	0.001	3	19.89	23	79	**PASS**	1	Step 1
24-hour PM_{10}	State	–	82	57.80	140	50	Step 2	5	**Fail**
	Federal	–	82	57.80	140	150	**PASS**	5	Step 1
Annual PM_{10}	State	–	26	13.87	40	20	Step 2	1	**Fail**
24-hour $PM_{2.5}$	Federal	–	52	55.01	107	35	Step 2	1.2	**Fail**
Annual $PM_{2.5}$	State	–	11	13.20	24	12	Step 2	0.3	**Fail**
	Federal*	–	11	13.20	24	9	Step 2	0.13	**Fail**
Level 2 AAQA									
1-hour NO_2	State	0.045	85	26.21	111	339	**PASS**	7.5	Step 1
	Federal	0.045	85	26.21	111	188	**PASS**	7.5	Step 1
Annual NO_2	State	0.008	15	2.79	18	57	**PASS**	1	Step 1
	Federal	0.008	15	2.79	18	100	**PASS**	1	Step 1
1-hour SO_2	Federal	0.009	24	1.26	25	196	**PASS**	7.8	Step 1
24-hour PM_{10}	State	–	82	1.70	83	50	Step 2	5	**PASS**
	Federal	–	82	1.70	83	150	**PASS**	5	Step 1
Annual PM_{10}	State	–	26	0.39	27	20	Step 2	1	**PASS**
24-hour $PM_{2.5}$	Federal	–	52	1.07	53	35	Step 2	1.2	**PASS**
Annual $PM_{2.5}$	State	–	11	0.39	11	12	**PASS**	0.3	Step 1
	Federal*	–	11	0.39	11	9	Step 2	0.3	**Fail**

Source: Appendix B3.

Notes: ppmv = parts per million by volume; ug/m^3 = micrograms per cubic meter; AAQS = Ambient Air Quality Standards; SIL = Significant Impact Level; CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ND = insufficient data available to determine the value.
The values shown include quantification of MM-AQ-8 (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and MM-AQ-11 (Operational Switcher Exhaust Minimization – Port of Stockton).

Because operational activities at the Port of Stockton would generate ambient concentrations of criteria pollutants (including $PM_{2.5}$) above the applicable thresholds with application of mitigation, this represents a cumulatively considerable increase in these pollutants. The SJVAB is designated as a nonattainment area for the national 24-hour and annual $PM_{2.5}$ standards, and as a nonattainment area for the California annual $PM_{2.5}$ standard, and as set forth in GAMAQI, a cumulatively considerable increase in $PM_{2.5}$ is considered to result in a cumulatively considerable net increase in $PM_{2.5}$. Therefore, the impact related to this portion of the project would be **significant and unavoidable.**

Port of Stockton - Conclusion

Overall, emissions from criteria pollutants during construction would not exceed the San Joaquin Valley APCD significance thresholds with implementation of SDF-AQ-1 and SDF-AQ-2 (Table 3.2-56). During operations, the Port of Stockton would result in a net increase in emissions and, as shown in Table 3.2-58, the increase in emissions would exceed the San Joaquin Valley APCD annual NO_X significance threshold prior to mitigation, and the impact would be potentially significant. After implementation of MM-AQ-2 through MM-AQ-4, MM-AQ-7, MM-AQ-8 and MM-AQ-11, the operational emissions at the Port of Stockton would still exceed numeric thresholds for NO_X (Table 3.2-60). Further, as demonstrated in Table 3.2-52, the project would result in operational activities that would generate ambient concentrations of criteria pollutants (including $PM_{2.5}$) above the applicable thresholds with application of mitigation. This represents a cumulatively considerable increase in $PM_{2.5}$ as the SJVAB is nonattainment for $PM_{2.5}$. Therefore, the impact related to this portion of the project would be significant and unavoidable.

This impact is reflective of project-related emissions occurring within the entire San Joaquin Valley APCD, a significant portion of which (such as the majority of rail transport emissions) may not be experienced in the immediate vicinity of the Port of Stockton. The following analysis of project-related emissions occurring within the City of Stockton itself does not affect the final impact conclusion of this EIR, but is noted here for informational purposes to help the public evaluate the effects of the project for the Stockton community.

Tables 3.2-64 through Table 3.2-67 present the estimated daily and annual operational localized emissions (unmitigated and mitigated) within the City of Stockton for informational purposes. (The City of Stockton has not established daily or annual thresholds for criteria air pollutants.)

Table 3.2-64. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – City of Stockton - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	<0.01	0.06	0.04	<0.01	<0.01	<0.01
Off-Road Equipment	0.29	1.53	17.09	0.03	0.06	0.06
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	13.22	360.36	35.67	18.33	7.64	7.03
Rail[c]	0.11	2.60	0.63	0.00	0.06	0.05
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**15.74**	**371.83**	**55.57**	**18.43**	**12.98**	**12.35**

Table 3.2-64. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – City of Stockton - Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Winter						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	<0.01	0.07	0.04	<0.01	<0.01	<0.01
Off-Road Equipment	0.29	1.53	17.09	0.03	0.06	0.06
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	13.22	360.36	35.67	18.33	7.64	7.03
Rail[c]	0.11	2.60	0.63	0.00	0.06	0.05
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**15.74**	**371.84**	**55.57**	**18.43**	**12.98**	**12.35**
Maximum	**15.74**	**371.84**	**55.57**	**18.43**	**12.98**	**12.35**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

a Stationary equipment includes the emissions from pellet storage and fire pumps.

b Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the City of Stockton.

c Rail includes the line haul train emissions within the City of Stockton.

d The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

Table 3.2-65. Estimated Annual Operation Criteria Air Pollutant Emissions – City of Stockton – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	0.30	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Off-Road Equipment	0.04	0.46	0.50	<0.01	0.01	0.01
Stationary Equipment[a]	0.01	0.16	0.03	0.01	0.91	0.91
Ships[b]	0.38	10.45	1.03	0.53	0.22	0.20
Rail[c]	<0.01	0.11	0.03	<0.01	<0.01	<0.01
Switcher[d]	0.03	0.50	0.15	0.00	0.02	0.02
Total	**0.76**	**11.69**	**1.75**	**0.54**	**1.16**	**1.14**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

a Stationary equipment includes the emissions from pellet storage and fire pumps.

b Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the City of Stockton.

c Rail includes the line haul train emissions within the City of Stockton.

d The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

Table 3.2-66. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – City of Stockton - Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	<0.01	0.06	0.04	<0.01	<0.01	<0.01
Off-Road Equipment	0.82	9.26	9.94	0.03	0.27	0.25
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	13.22	360.36	35.67	18.33	7.64	7.03
Rail[c]	0.11	2.60	0.63	0.00	0.06	0.05
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**16.27**	**379.56**	**48.42**	**18.43**	**13.19**	**12.54**
Winter						
Area	1.63	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	<0.01	0.07	0.04	<0.01	<0.01	<0.01
Off-Road Equipment	0.82	9.26	9.94	0.03	0.27	0.25
Stationary Equipment[a]	0.07	0.85	0.18	0.06	5.00	5.00
Ships[b]	13.22	360.36	35.67	18.33	7.64	7.03
Rail[c]	0.11	2.60	0.63	0.00	0.06	0.05
Switcher[d]	0.42	6.43	1.96	0.01	0.22	0.21
Total	**16.27**	**379.57**	**48.42**	**18.43**	**13.19**	**12.54**
Maximum	**16.27**	**379.57**	**48.42**	**18.43**	**13.19**	**12.54**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

[a] Stationary equipment includes the emissions from pellet storage and fire pumps.

[b] Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the City of Stockton.

[c] Rail includes the line haul train emissions within the City of Stockton.

[d] The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-11** (Operational Switcher Exhaust Minimization – Port of Stockton).

Table 3.2-67. Estimated Annual Operation Criteria Air Pollutant Emissions – City of Stockton – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	0.30	N/A	N/A	N/A	N/A	N/A
Energy	0	0	0	0	0	0
Mobile	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Off-Road Equipment	0.01	0.08	0.85	<0.01	<0.01	<0.01
Stationary Equipment[a]	0.01	0.16	0.03	0.01	0.91	0.91
Ships[b]	0.38	10.45	1.03	0.53	0.22	0.20

Table 3.2-67. Estimated Annual Operation Criteria Air Pollutant Emissions – City of Stockton – Mitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Rail[c]	<0.01	0.11	0.03	<0.01	<0.01	<0.01
Switcher[d]	0.03	0.50	0.15	0.00	0.02	0.02
Total	**0.73**	**11.31**	**2.10**	**0.54**	**1.15**	**1.13**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

[a] Stationary equipment includes the emissions from pellet storage and fire pumps.

[b] Ships includes the total emissions from cargo ships, tugboats, and pellet loadout within the City of Stockton.

[c] Rail includes the line haul train emissions within the City of Stockton.

[d] The Port of Stockton switcher includes the total emissions for switching material from the Lassen and Tuolumne facilities.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-11** (Operational Switcher Exhaust Minimization – Port of Stockton).

As indicated in Table 3.2-60, approximately 38% of the operational NO_X emissions attributable to Port of Stockton facility operations (9.24 tons per year) are generated by line haul train emissions occurring along rail lines extending from the northern and eastern boundaries of the San Joaquin Valley APCD to the project's port facilities. As shown in Table 3.2-67, only 1% of this rail travel (based on GIS data) occurs within the City of Stockton, and as a result, NO_X emissions from rail transport *experienced within the City of Stockton* are only 0.11 tons per year. As indicated in Table 3.2-60, approximately 58.7% of the operational NO_X emissions attributable to the Port facility operations (14.32 tons per year) are generated by ships occurring within San Joaquin Valley APCD boundaries. As shown in Table 3.2-67, 73% of this ship travel (based on GIS data) occurs within the City of Stockton. As a result, NO_X emissions from ship transport *experienced within the City of Stockton* are only 10.32 tons per year. Utilizing this figure would indicate that total NO_X emissions experienced within the City of Stockton would be 11.31 tons per year maximum (where 92% of the total NO_X emissions are due to ship transport). While not affecting the final impact conclusion, this data is presented here for informational purposes to help the public evaluate the effects of the project for the Stockton community.

Ship Transport – Bay Area AQMD

Ship transport would generate criteria air pollutants. As discussed in Section 3.2.4.1.3, pollutant emissions associated with ship transport operations were quantified using a spreadsheet model.

The estimated daily and annual emissions from cargo ships and tugboats within the Bay Area AQMD are shown in Table 3.2-68. (Emissions from cargo ships and tugboats within the San Joaquin Valley APCD jurisdiction have been evaluated against the San Joaquin Valley APCD thresholds earlier in this section. See Table 3.2-60).

Table 3.2-68. Estimated BAAQMMD Annual Criteria Air Pollutant Emissions – Ships - Unmitigated

Air District	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Pounds Per Day						
Bay Area AQMD	36.47	592.80	78.01	19.62	10.05	9.24
Bay Area AQMD Daily Threshold	54	54	N/A	N/A	82	54

Table 3.2-68. Estimated BAAQMMD Annual Criteria Air Pollutant Emissions – Ships - Unmitigated

Air District	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Threshold Exceeded?	No	Yes	N/A	N/A	No	No
Tons Per Year						
Bay Area AQMD	1.06	17.19	2.26	0.57	0.29	0.27
Bay Area AQMD Annual Threshold	10	10	N/A	N/A	15	10
Threshold Exceeded?	No	Yes	N/A	N/A	No	No

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005; Bay Area AQMD = Bay Area Air Quality Management District.

As shown in Table 3.2-68, emissions from ship transport within the Bay Area AQMD jurisdiction would exceed the Bay Area AQMD daily and annual threshold for NO_X. This impact would be **potentially significant.**

Potential mitigation measures were evaluated to attempt to decrease NO_X emissions below the thresholds that were exceeded; however, GSNR does not have operational control over the type of ships being used. Therefore, no feasible mitigation measures were identified. Ship transport occurring within the Bay Area AQMD would exceed the Bay Area AQMD daily and annual thresholds for NO_X, and there is no feasible mitigation. This represents a cumulatively considerable increase in **NO_X**. Every county within the Bay Area AQMD is nonattainment for O_3, and as set forth in GAMAQI, a cumulatively considerable increase in one or more O_3 precursors (such as **NO_X**) is considered to result in a cumulatively considerable net increase in O_3. Therefore, the impact related to this portion of the project would **be significant and unavoidable.**

Conclusion

Activities implemented under the project would generate levels of criteria air pollutants and precursors that are anticipated to exceed applicable air district thresholds, in regions that are nonattainment for these pollutants. With implementation of the mitigation measures described herein, there remain emissions of these pollutants in excess of the applicable thresholds of significance in these areas. Impacts associated with the potential for the project to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard are **significant and unavoidable.**

Health Effects of Criteria Air Pollutants (Impacts AQ-1 and AQ-2)

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 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 in original) (Sierra Club v. County of Fresno 2018). The following discussion summarizes the detailed information within Appendix B5, Health Effects of Criteria Air Pollutants.

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. Currently, 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 project to specific health effects. Within the state, currently, only the Sacramento Metropolitan Air Quality Management District (Sacramento Metropolitan AQMD) has established quantitative guidance (Sacramento Metropolitan AQMD 2020a); however, application of the Sacramento Metropolitan AQMD screening analysis is not appropriate for the project on the whole because activities and associated emissions largely occur outside of the region evaluated in the (Sacramento Metropolitan AQMD, Yolo-Solano AQMD, Placer County APCD, El Dorado County AQMD, and Feather River AQMD) and project emissions span multiple air districts. Project emissions do occur within Sacramento Metropolitan AQMD, Placer County APCD, El Dorado County AQMD, and Feather River AQMD as a result of feedstock acquisition and/or line-haul (train) travel whereas emissions would be dispersed (line-haul travel would be linear and not concentrated in one area) and the specific location within the air district is not identifiable at this time for feedstock activities, which would also likely not occur in one location for a prolonged period of time (e.g., under a year). The project would also result in air quality benefits associated with avoided wildfire and associated avoided criteria air pollutant emissions, which would complicate modeling as the specific location of the anticipated benefits cannot be determined at this time.

In connection with the judicial proceedings culminating in issuance of the Friant Ranch decision, the South Coast Air Quality Management District (South Coast AQMD) and the San Joaquin Valley APCD filed amicus briefs attesting to the extreme difficulty of correlating an individual project's criteria air pollutant emissions to specific health impacts. Both San Joaquin Valley APCD and South Coast AQMD have among the most sophisticated air quality modeling and health impact evaluation capabilities of the air districts in California. The key, relevant points from the South Coast AQMD and San Joaquin Valley APCD 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 PM are formed, dispersed, and regulated. The formation of O_3 and PM in the atmosphere, as secondary pollutants,[23] 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 VOC 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 2008c). Because of the complexity of O_3 formation, a specific tonnage amount of VOCs or NO_X emitted in a particular area does not equate to a particular concentration of O_3 in that area (San Joaquin Valley APCD 2015d). 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 (San Joaquin Valley APCD 2015d). 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 equivalent concentration of secondary PM in that area (San Joaquin Valley APCD 2015d). This is especially true for individual projects, like the project, where project-generated criteria air pollutant emissions are

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

not derived from a single "point source," but from construction equipment and mobile sources (passenger cars and trucks) driving to, from, and around the project sites.

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 (South Coast AQMD 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 (South Coast AQMD 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 (San Joaquin Valley APCD 2015d). 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 (San Joaquin Valley APCD 2015d). 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 project site on a particular day or month of the year, or what specific health impacts will occur (San Joaquin Valley APCD 2015d).

In regard to regional concentrations and air basin attainment, San Joaquin Valley APCD 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,[24] is a theoretical exercise. The San Joaquin Valley APCD 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" (San Joaquin Valley APCD 2015d). 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. San Joaquin Valley APCD noted that the currently available modeling tools are equipped to model the impact of all emission sources in the San Joaquin Valley Air Basin on attainment (San Joaquin Valley APCD 2015d). The San Joaquin Valley APCD brief then indicated that "[r]unning the photochemical grid model used for predicting O_3 attainment with the emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NO_x and VOC in the Valley) is not likely to yield valid information given the relative scale involved" (San Joaquin Valley APCD 2015d).

South Coast AQMD and San Joaquin Valley APCD have indicated that it is not feasible to quantify project-level health impacts based on existing modeling (South Coast AQMD 2015; San Joaquin Valley APCD 2015d). 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.

24 The Friant Ranch Specific Plan proposed 2,683 single-family age-restricted units, 83 multifamily age-restricted units, 180 non-age-restricted multifamily units, and 250,000 square feet of commercial village within a Village Core that also provides for up to 50 residential units on approximately 942 acres (County of Fresno 2010).

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[25] and the EPA Benefits Mapping and Analysis Program (BenMAP or BenMAP–Community Edition [CE]).[26] 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 $PM_{2.5}$.[27] To date, the six publicly available HIAs reviewed herein have concluded that the evaluated project's health effects associated with the estimated project-generated increase in concentrations of O_3 and $PM_{2.5}$ represent a small increase in incidences and a very small percent of the number of background incidences, indicating that these health impacts are negligible and potentially within the models' margin of error. It is also important to note that while the results of the six available HIAs conclude that the project emissions do not result in a substantial increase in health incidences, the estimated emissions and assumed toxicity is also conservatively inputted into the HIA and thus, overestimate health incidences, particularly for $PM_{2.5}$. The six reviewed HIAs were conducted for individual projects or defined areas such as a campus master plan or airport master plan, which differs from the project, where emissions may occur within 19 air districts.

The Sacramento Metropolitan AQMD's Guidance to Address the Friant Ranch Ruling for CEQA Projects in the Sac Metro Air District (Sacramento Metropolitan AQMD 2020a) included an approach for analyzing individual projects in addition to the screening tools for minor projects and strategic area project. The analysis of individual projects guidance states that "In order to estimate the health effects of the increases of criteria pollutants for a proposed Project, practitioners should apply a PGM to estimate the increases in concentrations of ozone and $PM_{2.5}$ in the region as a result of the emissions of criteria and precursor pollutants from a Project. Next apply the U.S. EPA-authored program, the Benefits Mapping and Analysis Program (BenMAP2), to estimate the resulting health effects from the increases in concentration" (Sacramento Metropolitan AQMD 2020a). The Sacramento Metropolitan AQMD guidance outlines the same or similar approach taken in the six available HIAs noted above, which as explained herein, has not produced meaningful information for the public.

The Bay Area AQMD released qualitative health effects assessment for criteria air pollutants guidance to address the Friant Ranch case as part of their 2022 CEQA Guidelines. The Bay Area AQMD guidance states that, "use of these [photochemical grid-based] models is typically beyond the resources available for air quality analysis prepared pursuant to CEQA, and even if such an analysis was to be completed consideration would need be given to ensure the results would be meaningful based on modeling and data limitations" (Bay Area AQMD 2022). The Bay Area AQMD guidance also states that, "data applicability should be considered to determine whether the model

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25 The first step in the publicly available health impact assessments (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 SCAQMD, 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 2023c).

26 After estimating the increase in concentrations of O_3 and $PM_{2.5}$, the second step in the six examples includes use of BenMAP or BenMAP-CE to estimate the resulting associated health effects. BenMAP estimates the number of health incidences resulting from changes in air pollution concentrations (EPA 2023d). The health impact function in BenMAP-CE 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 $PM_{2.5}$.

27 The following CEQA documents included a quantitative HIA to address Friant Ranch: (1) World Logistics Center Revised Final EIR (City of Moreno Valley 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 (City of San Jose 2019), (4) City of Inglewood Basketball and Entertainment Center Project EIR (City of Inglewood 2019), (5) San Diego State University Mission Valley Campus Master Plan EIR (SDSU 2019), and (6) California State University Dominguez Hills 2018 Campus Master Plan EIR (CSU Dominguez Hills 2019).

[BenMAP] may be appropriate for an air quality analysis prepared pursuant to CEQA and if such an analysis would provide meaningful results based on modeling and data limitations" (Bay Area AQMD 2022).

As explained in the San Joaquin Valley APCD 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 project is not likely to yield valid information given the relative scale involved. The six examples reviewed support the San Joaquin Valley APCD brief's contention that consistent, reliable, and meaningful results may not be provided by methods applied at this time and Bay Area AQMD's caution to provide meaningful information to the public. 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 percent of the number of background incidences, potentially within the models' margin of error. Nonetheless, further evaluation of project-generated criteria air pollutant emissions and associated health effects is provided below.

Construction of the Lassen Facility would result in emissions that would not exceed the Lassen County APCD daily BACT thresholds for criteria air pollutants after implementation of MM-AQ-5 (Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility) and MM-AQ-6 (Construction Lower-VOC Paints – Lassen Facility). Construction of the Tuolumne Facility and the Port of Stockton would result in emissions that would not exceed their respective Tuolumne County APCD and San Joaquin Valley APCD thresholds for criteria air pollutants without mitigation.

Operation of the project, including feedstock acquisition, wood pellet production, and transport to market, however, would result in exceedances of regional thresholds for emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$, even after implementation of mitigation.

As discussed in Section 3.2.1.1, Pollutants and Effects, health effects associated with O_3 include respiratory symptoms, worsening of lung disease leading to premature death, and damage to lung tissue. VOCs and NO_x are precursors to O_3 and the contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations due to O_3 precursor emissions tend to be found downwind of the source location because of the time required for the photochemical reactions to occur. Further, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur, because exceedances of the O_3 NAAQS and CAAQS tend to occur between April and October when solar radiation is highest. As described above, due to the lack of quantitative methods to assess this complex photochemistry, determining the holistic effect of a single project's emissions of O_3 precursors is not scientifically possible at this time. ("[I]f it is not scientifically possible to do more than has already been done to connect air quality effects with potential human health impacts, the EIR itself must explain why, in a manner reasonably calculated to inform the public of the scope of what is and is not yet known about the Project's impacts." Sierra Club v. County of Fresno 2018.)

That being said, as shown in Table 3.2-69, because the project would exceed the VOC thresholds in the Lassen County APCD and NO_x thresholds in the Bay Area AQMD, Butte County AQMD, Calaveras County APCD, El Dorado County AQMJD, Feather River AQMD, Lassen County APCD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD, Shasta County AQMD, and Tehama County APCD. However, for those counties designated as attainment or unclassified/unclassifiable areas for O_3 (i.e., Lassen County APCD) project-generated VOC and/or NO_x emissions may not cause an exceedance of the NAAQS and CAAQS for O_3 or result in potential health effects associated with O_3. For the air districts designated as nonattainment areas for O_3 (i.e., Bay Area AQMD, Butte County AQMD, Calaveras County APCD, El Dorado County AQMD, Feather River AQMD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD, Shasta County AQMD, and Tehama County APCD), project-generated VOC and/or NO_x emissions may contribute to health effects associated with O_3, but, as noted, it is not scientifically possible to quantify the precise magnitude of these effects.

Health effects associated with NO_x and NO_2 (which is a constituent of NO_x) include lung irritation and enhanced allergic responses (see Section 3.2.1.1). As shown in Table 3.2-68, project-related NO_x emissions would exceed the applicable NO_x thresholds in Bay Area AQMD, Butte County AQMD, Calaveras County APCD, El Dorado County AQMJD, Feather River AQMD, Lassen County APCD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD, Shasta County AQMD, and Tehama County APCD. Furthermore, as shown in Tables 3.2-43 and 3.2-53, operational activities at the Lassen Facility and Tuolumne Facility would generate ambient concentrations of criteria pollutants above the 1-hour NO_2 thresholds with application of mitigation. However, all the applicable air districts are designated as attainment areas for NO_2 (and NO_2 is a constituent of NO_x). Accordingly, project-generated NOx emissions may not cause an exceedance of the NAAQS and CAAQS for NO_2 or result in potential health effects associated with NO_2 and NO_x.

Health effects associated with CO include chest pain in patients with heart disease, headache, light-headedness, and reduced mental alertness (see Section 3.2.1.1). CO tends to be a localized impact associated with congested intersections, yet the project would also generate localized emissions of CO at the Lassen and Tuolumne facility sites from area sources, mobile sources, off-road equipment, and stationary sources that would exceed the applicable threshold of significance for CO after application of feasible mitigation measures. However, the project would not generate emissions of CO that would exceed the federal and California AAQS. The potential for CO hotspots is discussed under Impact AQ-3 below and determined to be less than significant. Thus, the project's CO emissions would not contribute to significant health effects associated with CO but, as noted, it is not scientifically possible to quantify the precise magnitude of these effects.

Health effects associated with PM_{10} and $PM_{2.5}$ include premature death and hospitalization, primarily for worsening of respiratory disease (see Section 3.2.1.1). As shown in Table 3.2-69, project-related PM_{10} emissions would exceed the applicable PM_{10} thresholds in Butte County AQMD, Calaveras County APCD, Feather River AQMD, Lassen County APCD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley ACPD, Shasta County AQMD, and Tehama County APCD. Furthermore, as shown in Tables 3.2-43 and 3.2-53, operational activities at the Lassen Facility and Tuolumne Facility would generate ambient concentrations of criteria pollutants above the applicable PM_{10} and $PM_{2.5}$ thresholds with application of mitigation. In addition, as shown in Table 3.2-63, operational activities at the Port of Stockton would generate ambient concentrations of criteria pollutants above the annual $PM_{2.5}$ threshold with application of mitigation. However, for those counties designated as attainment or unclassified/unclassifiable areas for PM_{10} (i.e., Lassen County APCD and Shasta County AQMD) and $PM_{2.5}$ (i.e., Calaveras County APCD, Lassen County APCD, Northern Sierra AQMD, Placer County AQMD, Sacramento Metropolitan AQMD, Shasta County AQMD, and Tehama County APCD), project-generated PM_{10} and/or $PM_{2.5}$ emissions may not cause an exceedance of the NAAQS and CAAQS for or result in potential health effects associated with PM_{10} or $PM_{2.5}$. For the air districts designated as nonattainment areas for PM_{10} (i.e., Butte County AQMD, Calaveras County APCD, Feather River AQMD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley ACPD, and Tehama County APCD) and/or $PM_{2.5}$ (i.e., Butte County AQMD, Feather River AQMD, San Joaquin Valley ACPD), project-generated PM_{10} and/or $PM_{2.5}$ emissions may contribute to health effects associated with PM_{10} or $PM_{2.5}$.

For the reasons noted above under Impacts AQ-1 and AQ-2, any attempt to quantify the actual nature and magnitude of these effects would be speculative. The determination that project activities in these districts may exceed the applicable thresholds has been based largely on a scenario in which all feedstock activities occur simultaneously within the same air district (which is unlikely in practice, but more precise determination of actual feedstock activities is not practicable at this programmatic stage). Even under this scenario, feedstock activities would be dispersed through forested regions within the district, which are typically remote from populated areas. The impact of a fugitive dust source on air pollution depends on the quantity, size, and drift potential of the dust particles injected into the atmosphere (EPA 1995). Therefore, the actual concentrations resulting at any given location, and the thus the associated magnitude of health effects, cannot be precisely determined.

Table 3.2-69 shows operational air district threshold exceedances and/or federal or California AAQS exceedances for multiple air districts. With the exception of Lassen County APCD, Tuolumne County APCD, and the San Joaquin Valley APCD, emissions would be a result of feedstock acquisition, rail transport, and/or ship transport only. As described in Section 3.2.4.1.1, it is likely that during feedstock acquisition, the project would have multiple crews operating in different air districts on a given day. However, for purposes of comparing emissions to the most stringent daily or annual threshold, it was conservatively assumed that all crews would be operating in the same air district 100% of the time, which is unlikely in practice.

Table 3.2-69. Health Effects of Criteria Air Pollutants – Criteria Air Pollutant Threshold Exceedances with Mitigation

Scenario	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Mass Daily or Annual Threshold Exceeded with Mitigation and/or AAQS Exceedance with Mitigation?					
Bay Area AQMD	No	**Yes**	No	No	No	No
Butte County AQMD	No	**Yes**	N/A	N/A	**Yes**	**Yes**
Calaveras County APCD	No	**Yes**	N/A	N/A	**Yes**	N/A
El Dorado County AQMD	No	**Yes**	N/A	N/A	N/A	N/A
Feather River AQMD	No	**Yes**	N/A	N/A	**Yes**	N/A
Lassen County APCD	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**
Mariposa County APCD	No	No	No	No	No	No
Northern Sierra AQMD	No	**Yes**	N/A	N/A	**Yes**	N/A
Placer County APCD	No	**Yes**	N/A	N/A	**Yes**	N/A
Sacramento Metropolitan AQMD	No	**Yes**	N/A	N/A	**Yes**	No
San Joaquin Valley APCD	No	**Yes**	No	No	**Yes**	**Yes**
Shasta County AQMD	No	**Yes**	N/A	N/A	**Yes**	N/A
Tehama County APCD	No	**Yes**	N/A	N/A	**Yes**	N/A
Tuolumne County APCD	No	**Yes**	**Yes**	N/A	**Yes**	N/A

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable; AAQS = ambient air quality standard; APCD = Air Pollution Control District; AQMD = Air Quality Management District.
This table only shows the operational impacts of the project. Construction impacts were described above.

While the above scientific and technological constraints present considerable doubt that quantifying health effects for individual CEQA projects may not accurately and meaningfully inform the public of how project-generated bare numbers (i.e., estimated criteria air pollutant emissions) translate to create potential adverse health effects, due to the size and scale of the project, additional analysis is presented below for emissions occurring within Lassen County, Tuolumne County, and San Joaquin County, where the two pellet facilities and the Port of Stockton are located, respectively, as well as for all project emissions within the State.

The EPA CO–Benefits Risk Assessment (COBRA) screening model was used to estimate the potential health effects of the project based on the emissions of air pollutants (EPA 2024d). The analysis year of 2028 was selected as it is closest to the project's operational year. The state of California and each respective county (Lassen, Tuolumne, and San Joaquin) was selected for the location. For the statewide run, California was selected as the geographical extent. The criteria air pollutant emissions estimated using the methodologies above (see Section 3.2.4.1 Methodology and Impact AQ-2) were assumed for each location. A discount rate of 2% was selected as it is the default. COBRA assumes changes in adult mortality and non-fatal heart attacks occur over a 20-year period.

For Lassen County,[28] O_3 and $PM_{2.5}$ related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (<0.004 incidences per year), lung cancer incidence (<0.004 incidences per year), all cardiovascular-related hospital admissions (not including myocardial infarctions) (<0.004 incidences per year), all respiratory-related hospital admissions (<0.004 incidences per year), mortality (0.05 incidences per year), and nonfatal acute myocardial infarction (less than <0.004 incidences per year for all age groups). For context, between 2020-2022, the CDPH reported that Lassen County had an annual average of 328.3 mortalities from all causes and an age-adjusted death rate of 886.8 mortalities per 100,000 population (CDPH 2024).

For Tuolumne County,[29] O_3 and $PM_{2.5}$ related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (<0.004 incidences per year), lung cancer incidence (<0.004 incidences per year), all cardiovascular-related hospital admissions (not including myocardial infarctions) (<0.004 incidences per year), all respiratory-related hospital admissions (<0.004 incidences per year), mortality (0.07 incidences per year), and nonfatal acute myocardial infarction (less than 0.01 incidences per year for all age groups). For context, between 2020-2022, the CDPH reported that Tuolumne County had an annual average of 807 mortalities from all causes and an age-adjusted death rate of 872.2 mortalities per 100,000 population (CDPH 2024).

For San Joaquin County,[30] O_3 and $PM_{2.5}$ related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (<0.004 incidences per year), lung cancer incidence (<0.004 incidences per year), all cardiovascular-related hospital admissions (not including myocardial infarctions) (<0.004 incidences per year), all respiratory-related hospital admissions (0.01 incidences per year), mortality (0.10 incidences per year), and nonfatal acute myocardial infarction (less than 0.02 incidences per year for all age groups). For context, between 2020-2022, the CDPH reported that San Joaquin County had an annual average of 6,890 mortalities from all causes and an age-adjusted death rate of 870.7 mortalities per 100,000 population (CDPH 2024).

28 The COBRA inputs for mitigated annual criteria air pollutant emissions within Lassen County include the following (see Table 3.2-41): 194.58 tons per year VOC, 158.46 tons per year NO_x, 0.32 tons per year SO_2, and 140.71 tons per year $PM_{2.5}$.
29 The COBRA inputs for mitigated annual criteria air pollutant emissions within Tuolumne County include the following (see Table 3.2-51): 86.16 tons per year VOC, 69.37 tons per year NO_x, 0.09 tons per year SO_2, and 67.45 tons per year $PM_{2.5}$.
30 The COBRA inputs for mitigated annual criteria air pollutant emissions within San Joaquin County include the following (see Table 3.2-60): 1.4 per year VOC, 24.36 tons per year NO_x, 0.69 tons per year SO_2, and 1.41 tons per year $PM_{2.5}$.

On a statewide level,[31] O_3 and $PM_{2.5}$ related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (0.03 incidences per year), lung cancer incidence (0.43 incidences per year), all cardiovascular-related hospital admissions (not including myocardial infarctions) (0.81 incidences per year), all respiratory-related hospital admissions (75 incidences per year), mortality (6.6 – 12 incidences per year), and nonfatal acute myocardial infarction (3.9 incidences per year for all age groups). For context, between 2020-2022, the CDPH reported that the state of California had an annual average of 322,300 mortalities from all causes and an age-adjusted death rate of 670 mortalities per 100,000 population (CDPH 2024).

As noted above, the Sacramento Metropolitan AQMD has developed Friant Ranch guidance and tools for projects located within the evaluated 5-Air-District Region. Project-generated emissions of feedstock and rail would occur with the Sacramento Metropolitan AQMD and Feather River AQMD jurisdiction; emissions of feedstock only would occur within El Dorado APCD and Placer County APCD jurisdiction.[32] Because the conservatively estimated maximum daily emissions would exceed the highest mass daily threshold of 82 pounds per day of NO_x assumed in the Minor Project Health Screening Tool, this evaluation uses the Strategic Area Project Health Screening instead, which can evaluate projects resulting in up to 8 times the emissions threshold (e.g., 656 pounds per day of VOC, NO_x, or $PM_{2.5}$)(Sacramento Metropolitan AQMD 2020b). The closest strategic area location was selected for each air district scenario based on where the emissions may occur.[33]

Using the Strategic Area Project Health Screening tool, for project emissions occurring within Sacramento Metropolitan AQMD, O_3-related health outcomes attributed to project-related increases in ambient air concentrations include all respiratory-related hospital admissions (0.33 incidences per year, 0.0017% of background incidences and mortality (0.21 incidences per year, 0.00071% of background incidences). $PM_{2.5}$-related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (3.5 incidences per year, 0.019% of background incidences), all respiratory-related hospital admissions (1.0 incidences per year, 0.0053% of background incidences), all cardiovascular-related hospital admissions (not including myocardial infarctions) (0.61 incidences per year, 0.0025% of background incidences), and mortality (6.9 incidences per year, 0.016% of background incidences). Complete results, including all health endpoints estimated, are provided in Appendix B5.

Similarly, based on the Strategic Area Project Health Screening tool, for project emissions occurring within Feather River AQMD, O_3-related health outcomes attributed to project-related increases in ambient air concentrations include all respiratory-related hospital admissions (0.16 incidences per year, 0.00083% of background incidences and mortality (0.1 incidences per year, 0.00034% of background incidences). $PM_{2.5}$-related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (0.33 incidences per year, 0.0018% of background incidences), all respiratory-related hospital admissions (0.11 incidences per year, 0.00055% of background incidences), all cardiovascular-related hospital admissions (not including myocardial infarctions) (0.055 incidences per year, 0.00023% of background incidences), and mortality

31 The COBRA inputs for mitigated annual criteria air pollutant emissions within San Joaquin County include the following (totals from multiple tables provided herein): 288.17 per year VOC, 370.29 tons per year NO_x, 1.96 tons per year SO_2, and 243.31 tons per year $PM_{2.5}$.

32 The Sacramento Metropolitan AQMD Strategic Area Project Health Effects Tool assumptions include the following: Sacramento Metropolitan AQMD: 18.41 pounds per day of VOC, 456.14 pounds per day of NO_x, and 81.15 pounds per day of $PM_{2.5}$. Feather River AQMD: 20.11 pounds per day of VOC, 496.39 pounds per day of NO_x, and 81.99 pounds per day of $PM_{2.5}$.
El Dorado County APCD: 10.58 pounds per day of VOC, 270.99 pounds per day of NO_x, and 77.26 pounds per day of $PM_{2.5}$.
Placer County APCD: 10.58 pounds per day of VOC, 270.99 pounds per day of NO_x, and 77.26 pounds per day of $PM_{2.5}$.

33 The following representative strategic area locations were assumed: South Sacramento for project emissions occurring within the Sacramento Metropolitan AQMD region, Woodland for project emissions occurring within the Feather River AQMD region, Rancho Cordova for project emissions occurring within the El Dorado County APCD region, and West Roseville for project emissions occurring within the Placer County ACPD region.

(0.70 incidences per year, 0.0016% of background incidences). Complete results, including all health endpoints estimated, are provided in Appendix B5.

For project emissions occurring within El Dorado County APCD, based on the Strategic Area Project Health Screening tool, O_3-related health outcomes attributed to project-related increases in ambient air concentrations include all respiratory-related hospital admissions (0.2 incidences per year, 0.001% of background incidences and mortality (0.13 incidences per year, 0.00043% of background incidences). $PM_{2.5}$-related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (1.8 incidences per year, 0.0096% of background incidences), all respiratory-related hospital admissions (0.66 incidences per year, 0.0034% of background incidences), all cardiovascular-related hospital admissions (not including myocardial infarctions) (0.38 incidences per year, 0.0016% of background incidences), and mortality (4.4 incidences per year, 0.0099% of background incidences). Complete results, including all health endpoints estimated, are provided in Appendix B5.

For project emissions occurring within Placer County APCD, based on the Strategic Area Project Health Screening tool, O_3-related health outcomes attributed to project-related increases in ambient air concentrations include all respiratory-related hospital admissions (0.23 incidences per year, 0.0012% of background incidences and mortality (0.15 incidences per year, 0.00051% of background incidences). $PM_{2.5}$-related health outcomes attributed to project-related increases in ambient air concentrations include asthma-related emergency room visits (1.3 incidences per year, 0.0069% of background incidences), all respiratory-related hospital admissions (0.43 incidences per year, 0.0022% of background incidences), all cardiovascular-related hospital admissions (not including myocardial infarctions) (0.23 incidences per year, 0.00094% of background incidences), and mortality (2.9 incidences per year, 0.0066% of background incidences). Complete results, including all health endpoints estimated, are provided in Appendix B5.

These results are considered conservative because the tool's outputs are based on the simulation of a full year of exposure at the maximum daily average of the increases in air pollution concentrations. In addition, the estimated maximum daily emissions are conservative because it was conservatively assumed that all feedstock crews would be operating in the same air district on the same day, which is unlikely in practice. Furthermore, it is more unlikely that all feedstock crews would be operating in the same air district every day of the year. For context, between 2020-2022, the CDPH reported that the counties included in the 5-Air-District Region (i.e., Sutter, Yuba, Placer, El Dorado, Sacramento, Yolo, Solano) had a total annual average of 26,652 mortalities from all causes (CDPH 2024).

Of note, the project would also result in air quality benefits associated with avoided wildfire and associated avoided criteria air pollutant emissions, which would complicate modeling as the specific location of the anticipated benefits cannot be determined at this time and those benefits are not included in the above COBRA modeling or Sacramento Metropolitan AQMD screening tools.

In summary, 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, and methods available to quantitatively evaluate health effects may not be appropriate to apply to emissions concentrations associated with the project, which cannot be estimated with a high-level of accuracy. Nonetheless, additional information is provided to support impact conclusions in AQ-1 and AQ-2 that explains what is known and what is not given constraints.

See Appendix B5 for a detailed discussion of health effects of project-generated criteria air pollutant emissions.

Avoided Criteria Air Pollutant Emissions from Wildfire

Sustainable Forest Management Projects would implement forest fuel treatments, including hazardous fuel reduction projects, construction of shaded fuel breaks, and salvage harvests to reduce the impacts of wildfires. Forest fuel treatments can result in substantial reductions in emissions produced by wildfires (Brodie et al, 2024, North and Hurteau, 2011, Stephens et al., 2012). Fuels treatments reduce the severity of wildfires and therefore result in reduced fuel consumption and associated emissions. Treated stands often experience greater levels of carbon retained in live trees compared to untreated stands following wildfire.

As outlined in Chapter 3.7, Greenhouse Gas Emissions, within this EIR, an assessment was performed to evaluate potential changes in emissions due to reduced wildfires as a result of fuel treatment activities. The avoided wildfire criteria air pollutant emissions are presented below for informational purposes and are not considered in the impact significance conclusions.

The Forest Vegetation Simulator (FVS) provides $PM_{2.5}$ emissions during wildfire based on fuels composition and wildfire severity. Predicted $PM_{2.5}$ emissions from wildfires in treated and untreated stands were then cross walked to the Fire Order Fire Effects Model (FOFEM) to quantify other emission types. FOFEM uses emission factors to calculate particulate and chemical emissions based on the fuel consumed during flaming and smoldering combustion (Ward and Hardy 1991). These emission factors allow the determination of CO, SO_2, NO_x, and PM_{10} emissions from the known $PM_{2.5}$ emissions calculated in FVS. Table 3.2-70 presents the estimated changes in potential criteria air pollutant emissions due to forest thinning projects conducted by GSNR only.

Table 3.2-70. Avoided Wildfire Criteria Air Pollutant Emissions Due to GSNR Only Thinning Projects

Pollutant	Untreated Stands (tons)	Treated Stands (tons)	Emissions Reduction (tons)	Emissions Reduction (tons per year)[a]
CO	6,208,259	5,439,164	769,095	**38,455**
NO_X	13,754	12,160	1,594	**80**
SO_2	25,106	22,020	3,086	**154**
$PM_{2.5}$	474,530	415,778	58,752	**2,938**
PM_{10}	559,946	490,618	69,328	**3,466**

Notes: NO_x = oxides of nitrogen; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
See Appendix B6.
[a] Total emissions were divided by 20 years, which is the project's estimated lifespan.

As presented above in Table 3.2-70, emissions from wildfires predicted to occur over the life of the project are substantially reduced in treated stands. In practical terms, this means that the project is likely to produce substantial air quality benefits that could holistically offset its criteria pollution emissions. For example, the total annual emissions of PM_{10} and $PM_{2.5}$ generated by project operations (i.e., feedstock acquisition, Lassen Facility and Tuolumne Facility operations, line haul transport, Port of Stockton operations, and ship transport) are approximately 403 and 245 tons per year, respectively – which is substantially *less* than the reductions anticipated to result from project operations, as set forth in Table 3.2-70. These potential air quality benefits are identified here for informational purposes only, and have not been taken into account for purposes of the air quality impact significance determinations in this chapter (or to reduce any otherwise applicable mitigation requirements).

Impact AQ-3 The project would potentially expose sensitive receptors to substantial pollutant concentrations.

Feedstock Acquisition

Sustainable Forest Management Projects

Toxic Air Contaminants

Implementation of treatments under the Sustainable Forest Management Projects would result in exhaust emissions of diesel PM from off-road equipment and haul truck trips associated with treatment activities. Heavy-duty construction equipment is subject to a CARB Airborne Toxics Control Measure for in-use diesel construction equipment to reduce diesel particulate emissions. According to the Office of Environmental Health Hazard Assessment, health risk assessments (which determine the exposure of sensitive receptors to toxic emissions) should be based on a 30-year exposure period for the maximally exposed individual resident; however, such assessments should also be limited to the period/duration of activities associated with the project. Multiple crews would move across treatment sites such that diesel PM generated by treatment activities would not take place near any single sensitive receptor for an extended period. This means the period during which a single person could be exposed to diesel PM emissions from a treatment activity would be short relative to the 30-year exposure period recommended for health risk assessments.

Additionally, CARB has established that diesel PM concentrations substantially reduce at approximately 1,000 feet from their source (CARB 2005). Treatment activities would take place in forested areas away from potential sensitive receptors. Also, PDF-NOI-4 requires vegetation treatment activities and staging areas be located as far as possible from human receptors and PDF-NOI-5 restricts equipment idling time.

Therefore, TACs generated during Sustainable Forest Management Projects are not expected to result in concentrations causing significant health risks, and impacts would be **less than significant**.

Furthermore, implementation of **MM-AQ-1** (Operational Equipment Exhaust Minimization – Tier 4 Final – Feedstock Acquisition) and MM-AQ-3 (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would significantly reduce diesel PM generated by off-road equipment during feedstock acquisition.

Carbon Monoxide Hotspots

As discussed previously, a CO hot spot is a localized concentration of CO that is above the state or national 1-hour or 8-hour ambient air standards for the pollutant. Projects that do not generate CO concentrations in excess of the health-based CAAQS would not contribute a significant level of CO such that localized air quality and human health would be substantially degraded.

As discussed under Impacts AQ-1 and AQ-2, while implementation of Sustainable Forest Management Projects will generate localized CO emissions at the individual project sites. These emissions would be temporary and of short duration. Further, it is anticipated that these project sites will be dispersed and generally in forested areas not in close proximity to sensitive receptors. While the combined total of all Sustainable Forest Management Projects occurring in the Lassen Feedstock Working Area would exceed the most stringent daily air district threshold for CO (see Table 3.2-26), the CO emissions at any individual project site (1/33 of that total, see text accompanying

Table 3.2-8) would be significantly below the most stringent daily significance threshold. (The combined total CO emissions in the Tuolumne Feedstock Working Area – and thus those of individual projects in that area – would likewise be below the most stringent daily significance threshold. See Table 3.2-30.)

Beyond the individual Sustainable Forest Management Project sites, the potential for the project to result in localized CO impacts at intersections resulting from addition of its traffic volumes is assessed based on the CO "hot spot" analysis conducted by the South Coast Air Quality Management District (SCAQMD) for their request to the USEPA for resignation as a CO attainment area (South Coast AQMD 2003). In SCAQMD's analysis, they modeled the four most congested intersections identified in their basin (South Coast Air Basin [SCAB]). The most congested intersection, Wilshire Boulevard and Veteran Avenue, had an average daily traffic volume of 100,000 vehicles/day.

The SCAQMD's analysis found that these intersections had an average 7.7 ppm 1-hour CO concentrations predicted by the models, which is only 38.5% of the 1-hour CO CAAQS of 20 ppm. Therefore, even the most congested intersections in SCAQMD's air basin would not experience a CO "hot spot".

The air quality monitoring station closest to the most congested intersection in Los Angeles County (Wilshire Boulevard/Veteran Avenue) is the VA Hospital, West Los Angeles Station (Site ID 060370113) located at Wilshire Boulevard and Sawtelle Boulevard, approximately 0.5 miles to the southwest. For the original analysis year (2002), the maximum ambient CO levels monitored at this representative monitoring station were 4.3 ppm 1-hour CO concentrations and 2.7 ppm 8-hour concentrations. For the most recent year of available data (2021), the maximum ambient CO levels were 1.5 ppm for 1-hour CO concentrations and 1.0 ppm for 8-hour concentrations. There is noticeable improvement in background levels of CO since the SCAQMD's regional hotspot analysis.

In addition, the CO "hot spot" analysis performed by the SCAQMD included emissions for 1997 and 2002. In 1997, the running exhaust emission factor was 13.13 grams CO per mile and the idling exhaust CO emission factor was 2.43 grams CO per mile. In 2002, the running exhaust emission factor went down to 7.98 grams CO per mile and the idling exhaust CO emission factor went down to 1.30 grams CO per mile. This decrease in CO emission factors is indicative of a phase-out of older vehicles and increasingly strict emissions standards implemented by CARB. Continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion means that the potential for CO hotspots in the state is likely to decrease.

Implementation of Sustainable Forest Management Projects would result in 547 average daily trips as a result of logging/haul trucks in the Lassen Feedstock area and 236 average daily trips as a result of logging/haul trucks in the Tuolumne Feedstock area. The projects would be temporary in nature and occur in areas where vegetation management would be consistent with land use and the circulation system (such as forest lands and timberlands). The projects would be dispersed between several crews that could be driving on multiple haul routes on a given day. Furthermore, these feedstock areas are primarily rural, the population is low, and local roads are typically traversed by residents. Therefore, Sustainable Forest Management Projects are unlikely to create a traffic scenario that have an ADT greater than the 100,000 that was anticipated for the most congested intersection analyzed by SCAQMD and would not cause a CO hotspot while acquiring feedstock. Consequently, implementation of the project would not result in CO concentrations in excess of the health protective CAAQS or NAAQS, and as such, would not expose sensitive receptors to significant pollutant concentrations or health effects. Therefore, impacts related to sensitive receptor exposure to substantial CO concentrations would be **less than significant**, and no mitigation measures are required.

Valley Fever Exposure

Valley Fever is caused by inhalation of dust containing the Coccidioides immitis, a fungal spore. Most people who are exposed have no or very mild systems; however, in a small percentage of the population, it can generate more serious systems of meningitis, pneumonia, or chronic fatigue. As described in Section 3.2.1.1.2, treatment activities within the Lassen Feedstock area would not take place in any counties that are highly endemic for Valley Fever, as their incidence rates are well below the statewide average. However, treatment activities within the Tuolumne Feedstock area could take place in Madera County, Fresno County, Tulare County, or Merced County, which are all counties that are highly endemic to Valley Fever, as their annual incidence rates of Valley Fever are greater than 20 cases per 100,000 persons per year.

Sustainable forest management projects would not involve grading or earth-moving operations, but they would require off-road equipment for treatment activities that could potentially disturb the soil. As described in PDF-AQ-1 (Air District Regulatory Compliance – Feedstock Acquisition), the project would be required to comply with air district guidance related to fugitive dust control, which would help control the release of the Coccidioides immitis fungus during treatment activities. Additionally, PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) requires a 15-mph speed limit on unpaved surfaces and treatment crews to wet unpaved roads using water trucks or treat roads with a non-toxic chemical dust suppressant (e.g., emulsion polymers, organic material) during dry, dusty conditions, which would reduce the risk of airborne fungal spores.

However, workers have increased risk of exposure, since this job results in the disturbance of soils where fungal spores are found. Valley Fever infection rates are highest in California from June to November. Therefore, a risk of Valley Fever infection exists for construction personnel working on the project in the peak summer and fall months. Therefore, the project would have a **potentially significant impact** with respect to Valley Fever exposure for sensitive receptors and mitigation is required.

The project would implement **MM-AQ-12** (Operational Valley Fever Exposure Minimization – Feedstock Acquisition), which would require GSNR to implement additional dust control when operating in highly endemic counties (Madera, Merced, Fresno, and Tulare). **MM-AQ-12** would also require GSNR to implement a worker training program.

As a result, the impact of Valley Fever exposure would be **less than significant with mitigation**.

Naturally Occurring Asbestos

Treatment activities implemented under the project could involve ground disturbing activities such as vehicle travel on unpaved roads and use of off-road equipment in areas where NOA is present, which may result in NOA becoming airborne. PDF-AQ-2 would limit exposure of people to fugitive dust emissions generated by treatment activities implemented under the project. PDF-AQ-3 (Naturally Occurring Asbestos Best Practices – Feedstock Acquisition) requires project proponents to avoid ground-disturbance in areas identified as likely to contain NOA as indicated on maps and guidance published by the California Geological Survey, unless an Asbestos Dust Control Plan (17 CCR Section 93105) is prepared and approved by the applicable local air district. PDF-AQ-3 also requires treatment crews to follow any NOA-related guidance provided by the applicable local air district, reducing the risk of encountering NOA or generating airborne NOA emissions. Additionally, PDF-AQ-2 (Fugitive Dust Control – Feedstock Acquisition) requires a 15-mph speed limit on unpaved surfaces and treatment crews to wet unpaved roads using water trucks or treat roads with a non-toxic chemical dust suppressant (e.g., emulsion polymers, organic material) during dry, dusty conditions, which would reduce the risk of airborne NOA emissions. Implementation of PDF-AQ-2 and PDF-AQ-3 would minimize the potential for people to be exposed to NOA. As a result, this impact would be **less than significant.**

Wood Pellet Production

Lassen Facility

Toxic Air Contaminants

Construction Health Risk

As discussed in Section 3.2.4.1.2, the project would emit TAC's during construction. A HRA was performed to evaluate potential cancer and non-cancer health risk impacts to sensitive receptors proximate to the site. Table 3.2-71 shows the unmitigated HRA results during construction.

Table 3.2-71. Lassen Facility Construction Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	13.0	10	**Potentially Significant**
Chronic Hazard Index – Residential	Index Value	0.01	1.0	Less than Significant

Source: Lassen County APCD 2020.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-71, cancer risk during construction would exceed the Lassen County APCD threshold of 10 in 1 million. Chronic non-cancer health impacts would be less than significant. As such, mitigation is required.

MM-AQ-2 (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility) and **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce DPM by restricting idling times and implementing renewable diesel fuel, which are not quantified herein. **MM-AQ-5** (Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility) would reduce DPM by requiring the project to minimize construction off-road equipment exhaust with Tier 4 Final equipment, which is quantified.

Table 3.2-72 shows the cancer and non-cancer health risk impacts incorporating mitigation.

Table 3.2-72. Lassen Facility Construction Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	6.0	10	Less than Significant
Chronic Hazard Index – Residential	Index Value	0.01	1.0	Less than Significant

Source: Lassen County APCD 2020.
Note: CEQA = California Environmental Quality Act.

See Appendix B4.
The values shown include quantification of **MM-AQ-5** (Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility).

As shown in Table 3.2-72, with mitigation, cancer and chronic non-cancer health risk impacts would be below Lassen County APCD significance thresholds. Impacts would be **less than significant** with mitigation.

Operational Health Risk

As discussed in Section 3.2.4.1.2, the project would emit TAC's during operation from combustion sources. A HRA was performed to evaluate potential cancer and non-cancer health risk impacts to sensitive receptors proximate to the site. Table 3.2-73 shows the unmitigated HRA results during operation.

Table 3.2-73. Lassen Facility Operation Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	41.1	10	**Potentially Significant**
Chronic Hazard Index – Residential	Index Value	0.04	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Lassen County APCD 2020.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-73, cancer risk during operation would exceed the Lassen County APCD threshold of 10 in 1 million. Chronic non-cancer health impacts would be less than significant. As such, mitigation is required.

MM-AQ-2 (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility) and **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce DPM, which are not quantified herein. **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-9** (Operational Switcher Locomotive Exhaust Minimization – Lassen Facility) would reduce DPM emissions by requiring Tier 4 Final engines for the off-road equipment and on-site switcher locomotive at the Lassen Facility, which are quantified.

Table 3.2-74 shows the cancer and non-cancer health risk impacts incorporating mitigation.

Table 3.2-74. Lassen Facility Operation Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	28.6	10	**Significant and Unavoidable**
Chronic Hazard Index – Residential	Index Value	0.03	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Lassen County APCD 2020.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-9** (Operational Switcher Locomotive Exhaust Minimization – Lassen Facility).

As shown in Table 3.2-74, with mitigation, cancer risk would still be above the Lassen County APCD significance thresholds. The acute and chronic non-cancer health risk impacts would be below Lassen County APCD significance thresholds. Impacts would be **significant and unavoidable** with mitigation.

Combined Construction and Operational Health Risk

The sensitive receptors proximate to the site would be exposed to TACs during construction and operation as discussed above. As such, for disclosure purposes, the construction and operational health risk impacts were combined at the maximally exposed receptor. The unmitigated combined health risk impacts of the project are shown in Table 3.2-75 below.

Table 3.2-75. Lassen Facility Combined Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	50.7	10	**Potentially Significant**
Chronic Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Lassen County APCD 2020.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-75, combined cancer risk would exceed the Lassen County APCD threshold of 10 in 1 million. Chronic and acute non-cancer health impacts would be less than significant. As such, mitigation is required.

Table 3.2-76 shows the cancer and non-cancer health risk impacts incorporating **MM-AQ-2** and **MM-AQ-3**, which are not quantified, and **MM-AQ-5**, **MM-AQ-8**, and **MM-AQ-9**, which are quantified.

Table 3.2-76. Lassen Facility Combined Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	33.2	10	**Significant and Unavoidable**
Chronic Hazard Index – Residential	Index Value	0.04	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Lassen County APCD 2020.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.
The values shown include quantification of **MM-AQ-5** (Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility), **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton), and **MM-AQ-9** (Operational Switcher Locomotive Exhaust Minimization – Lassen Facility).

As shown in Table 3.2-76, with mitigation, combined cancer risk would still be above the Lassen County APCD significance thresholds. The acute and chronic non-cancer health risk impacts would be below Lassen County APCD significance thresholds. Combined impacts would be **significant and unavoidable** with mitigation.

Carbon Monoxide Hotspots

Construction of the Lassen Facility would generate localized emissions of CO at the facility site, primarily from offroad equipment and construction worker vehicles, vendor trucks, and haul trucks. These impacts would be short-term in nature lasting only during the duration of construction. As indicated in Tables 3.2-34 and 3.2-37, these emissions would not exceed the Lassen County APCD threshold of significance for CO, and would not exceed any applicable ambient air quality standard for CO. During operations, the Lassen Facility would generate localized emissions of CO at the facility site from area sources, mobile sources, off-road equipment, and stationary sources, as described in Section 3.2.4.1.2. These emissions would exceed the Lassen County APCD threshold of significance for CO; however, they would not exceed the federal and California AAQS for CO under the Level 2 AAQA after application of feasible mitigation measures, (Tables 3.2-40 and 3.2-43.).

Beyond the facility site, construction of the Lassen Facility would have trip generation associated with construction worker vehicles, vendor trucks, and haul trucks. This traffic, and any localized emissions of CO occurring along the route, would be short-term in nature lasting only during the duration of construction. As indicated in the Lassen Traffic Impact Assessment, "[d]uring construction, the amount of vehicular traffic is estimated to be less than operational traffic." Regional access to the Lassen Facility would be from Lassen State Highway/SR-299, between Roosevelt Avenue and Adams Avenue, and Washington Avenue, east of 4th Street. The Lassen Transportation Impact Assessment indicates that the segment on SR-299 between Roosevelt Ave and Adams Ave may add the highest daily traffic volumes and has an existing ADT of 2,244, which is approximately 2% of the most congested intersection in the SCAB (Appendix I2). The additional trips anticipated with operation of the project on this road segment (896 ADT) could increase ADT at this intersection to 3,140 (with construction traffic being less, as noted above). This scenario assumes that each new daily trip generated by the project would travel through the SR-299 segment, which is unlikely in practice but provides an absolute worst-case scenario for conservative analysis. Even with this conservative assumption, project-generated trips would only represent 3% of the most congested intersection in the SCAB, which were determined to not experience a CO "hot spot" according to SCAQMD's 2003 analysis (see Carbon Monoxide Hotspots section within Feedstock Acquisition section above). Because emissions of CO would be lower than those used in the SCAQMD analysis, no traffic-related CO "hot spots" are anticipated as was concluded in the SCAQMD analysis. Given that the proposed Lassen Facility will not result in traffic that exceeds traffic volumes considered in the SCAQMD analysis, coupled with the considerably low level of CO concentrations in the project area, and continued improvements in vehicle emissions, the Lassen Facility is not anticipated to result in traffic-related CO "hot spots" outside the facility site.

Implementation of the project would not result in CO concentrations in excess of the health protective CAAQS or NAAQS at the Lassen Facility site, after application of feasible mitigation measures described under Impacts AQ-1 and AQ-2. Therefore, impacts related to sensitive receptor exposure to CO concentrations at this site are **less than significant.**

Traffic associated with construction and operation of the Lassen Facility would not result in CO concentrations in excess of these standards beyond the immediate vicinity of the facility site, and as such, would not expose sensitive receptors to significant pollutant concentrations or health effects. Therefore, impacts related to sensitive receptor exposure to substantial CO concentrations beyond the immediate vicinity of the facility site would be **less than significant.**

Valley Fever Exposure

As described in Section 3.2.1.1.2, Valley Fever is not highly endemic to Lassen County, and within Lassen County, the incidence rate is below the statewide average. Construction of the Lassen Facility would implement SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton) to reduce fugitive dust during construction. SDF-AQ-2 implements a dust control plan that includes requirements of watering exposed areas 3 times per day, watering demolished areas twice daily, watering unpaved roads twice daily, and limiting vehicle speeds to 15 mph on unpaved roads. The nearest off-site sensitive receptor is located 184 feet away from the Lassen Facility. Based on the low incidence rate of Coccidioidomycosis in Lassen County, and with the project's implementation of SDF-AQ-2, it is not anticipated that earth-moving activities during construction would result in exposure of nearby sensitive receptors to Valley Fever. Therefore, the project would have a **less-than-significant** impact with respect to Valley Fever exposure for sensitive receptors.

Naturally Occurring Asbestos

The Lassen Facility site is not underlain by ultramafic or serpentine rock. Therefore, it is not expected that the Lassen Facility would contain NOA. Furthermore, the project would implement SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton), which would reduce project-generated construction dust. Therefore, the impact of NOA on sensitive receptors would be **less than significant.**

Tuolumne Facility

Toxic Air Contaminants

Construction Health Risk

As discussed in Section 3.2.4.1.2, the project would emit TAC's during construction. A HRA was performed to evaluate potential cancer and non-cancer health risk impacts to sensitive receptors proximate to the site. Table 3.2-77 shows the unmitigated HRA results during construction.

Table 3.2-77. Tuolumne Facility Construction Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	53.4	10	**Potentially Significant**
Chronic Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Tuolumne County APCD 2023.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-77, cancer risk during construction would exceed the Tuolumne County APCD threshold of 10 in 1 million. Chronic non-cancer health impacts would be less than significant. As such, mitigation is required.

MM-AQ-2 (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility) and **MM-AQ-3** (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility) would reduce DPM by restricting idling times and incorporating renewable diesel, which are not quantified herein. **MM-AQ-10** (Construction Equipment Exhaust Minimization – Tier

4 Final – Tuolumne Facility) would reduce DPM emissions by requiring Tier 4 Final engines for the off-road equipment at the Tuolumne Facility, which is quantified.

Table 3.2-78 shows the cancer and non-cancer health risk impacts incorporating mitigation.

Table 3.2-78. Tuolumne Facility Construction Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	16.5	10	**Significant and Unavoidable**
Chronic Hazard Index – Residential	Index Value	0.02	1.0	Less than Significant

Source: Tuolumne County APCD 2023.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.
The values shown include quantification of **MM-AQ-10** (Construction Equipment Exhaust Minimization – Tier 4 Final – Tuolumne Facility).

As shown in Table 3.2-78, with mitigation, cancer risk during construction would exceed the Tuolumne County APCD threshold of 10 in 1 million. Chronic non-cancer health impacts would be less than significant. Impacts would be **significant and unavoidable** with mitigation.

Operational Health Risk

As discussed in Section 3.2.4.1.2, the project would emit TAC's during operation from combustion sources. A HRA was performed to evaluate potential cancer and non-cancer health risk impacts to sensitive receptors proximate to the site. Table 3.2-79 shows the unmitigated HRA results during operation.

Table 3.2-79. Tuolumne Facility Operation Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	58.0	10	**Potentially Significant**
Chronic Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Tuolumne County APCD 2023.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-79, cancer risk during operation would exceed the Tuolumne County APCD threshold of 10 in 1 million. Chronic and acute non-cancer health impacts would be less than significant. As such, mitigation is required.

MM-AQ-2 (Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility) and **MM-AQ-3** (Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce DPM by restricting idling times and incorporating renewable diesel, which are not quantified herein. **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) would reduce DPM emissions by requiring Tier 4 Final engines for the off-road equipment at the Tuolumne Facility, which is quantified.

Table 3.2-80 shows the cancer and non-cancer health risk impacts incorporating **MM-AQ-8**.

Table 3.2-80. Tuolumne Facility Operation Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	40.9	10	**Significant and Unavoidable**
Chronic Hazard Index – Residential	Index Value	0.04	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Tuolumne County APCD 2023.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.
The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockon).

As shown in Table 3.2-80, with mitigation, cancer risk would still be above the Tuolumne County APCD significance thresholds. The acute and chronic non-cancer health risk impacts would be below Tuolumne County APCD significance thresholds. Impacts would be **significant and unavoidable** with mitigation.

Combined Health Risk

The sensitive receptors proximate to the site would be exposed to TACs during construction and operation as discussed above. As such, for disclosure purposes, the construction and operational health risk impacts were combined at the maximally exposed receptor. The unmitigated combined health risk impacts of the project are shown in Table 3.2-81 below.

Table 3.2-81. Tuolumne Facility Combined Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	111.4	10	**Potentially Significant**
Chronic Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Tuolumne County APCD 2023.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-81, combined cancer risk would exceed the Tuolumne County APCD threshold of 10 in 1 million. Chronic and acute non-cancer health impacts would be less than significant. As such, mitigation is required.

Table 3.2-82 shows the cancer and non-cancer health risk impacts incorporating **MM-AQ-2** and **MM-AQ-3**, which are not quantified, and **MM-AQ-8** and **MM-AQ-10**, which are quantified.

Table 3.2-82. Tuolumne Facility Combined Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	57.4	10	**Significant and Unavoidable**
Chronic Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant
Acute Hazard Index – Residential	Index Value	0.1	1.0	Less than Significant

Source: Tuolumne County APCD 2023.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.
The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockon) and **MM-AQ-10** (Construction Equipment Exhaust Minimization – Tier 4 Final – Tuolumne Facility).

As shown in Table 3.2-82, with mitigation, combined cancer risk would still be above the Tuolumne County APCD significance thresholds. The acute and chronic non-cancer health risk impacts would be below Tuolumne County APCD significance thresholds. Combined impacts would be **significant and unavoidable** with mitigation.

Carbon Monoxide Hotspots

Construction of the Tuolumne Facility would generate localized emissions of CO at the facility site, primarily from offroad equipment and construction worker vehicles, vendor trucks, and haul trucks. These impacts would be short-term in nature lasting only during the duration of construction. As indicated in Tables 3.2-44, 3.2-45, and 3.2-47, these emissions would not exceed the Tuolumne County APCD threshold of significance for CO, and would not exceed any applicable ambient air quality standard for CO. During operations, the Tuolumne Facility would generate localized emissions of CO at the facility site from area sources, mobile sources, off-road equipment, and stationary sources, as described in Section 3.2.4.1.2. These emissions would exceed the Tuolumne County APCD annual threshold of significance for CO; however, they would not exceed the federal and California AAQS for CO under the Level 2 AAQA, after application of feasible mitigation measures. (Tables 3.2-50 and 3.2-52.)

Beyond the facility site, construction of the Tuolumne Facility would have trip generation associated with construction worker vehicles, vendor trucks, and haul trucks. This traffic, and any localized emissions of CO occurring along the route, would be short-term in nature lasting only during the duration of construction. As indicated in the Tuolumne Traffic Impact Assessment, "[d]uring construction, the amount of vehicular traffic is estimated to be less than operational traffic." Regional access to the Tuolumne Facility would be from SR-120 - SR-108, west of La Grange Road - CR J59, and La Grange Road - CR J59, south of SR-120 - SR-108. The Tuolumne Transportation Impact Assessment indicates that the segment on La Grange Road - CR J59, south of SR-120 - SR-108 may add the highest daily traffic volumes and has an existing ADT of 4,212, which is approximately 4% of the most congested intersection in the SCAB (Appendix I3). The additional trips anticipated with operation of the project on this road segment (674 ADT) could increase ADT at this intersection to 4,886 (with construction traffic being less, as noted above). This scenario assumes that each new daily trip generated by the project would travel through the La Grange Rd segment, which is unlikely in practice but provides an absolute worst-case scenario for conservative analysis. Even with this conservative assumption, project-generated trips would only represent 4% of the most congested intersection in the SCAB, which were determined to not experience a CO “hot spot” according to SCAQMD’s 2003 analysis (see Carbon Monoxide Hotspots section within Feedstock Acquisition section above). Because emissions of CO would be lower than those used in the SCAQMD analysis, no traffic-related CO “hot spots” are anticipated as was concluded in the SCAQMD analysis. Given that the proposed Tuolumne Facility will not result in traffic that exceeds traffic volumes considered in the SCAQMD analysis, coupled with the considerably low level of CO concentrations in the project area, and continued improvements in vehicle emissions, the Tuolumne Facility is not anticipated to result in traffic-related CO “hot spots” outside the facility site.

Implementation of the project would not result in CO concentrations in excess of the health protective CAAQS or NAAQS at the Tuolumne Facility Site, after application of the mitigations measures described under Impact AQ-1 and AQ-2. Therefore, impacts related to sensitive receptor exposure to CO concentrations at this site are **less than significant.**

Traffic associated with construction and operation of the Tuolumne facility would not result in CO concentrations in excess of these standards beyond the immediate vicinity of the facility site, and as such, would not expose sensitive receptors to significant pollutant concentrations or health effects. Therefore, impacts related to sensitive receptor exposure to substantial CO concentrations beyond the immediate vicinity of the facility site would be **less than significant.**

Valley Fever Exposure

As described in Section 3.2.1.1.2, Valley Fever is not highly endemic to Tuolumne County, and within Tuolumne County, the incidence rate is below the statewide average. The project would implement SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton) to reduce fugitive dust during construction of the Tuolumne Facility. SDF-AQ-2 implements a dust control plan that includes requirements of watering exposed areas 3 times per day, watering demolished areas twice daily, watering unpaved roads twice daily, and limiting vehicle speeds to 15 mph on unpaved roads. The nearest off-site sensitive receptor is located 174 feet away from the Tuolumne Facility. Based on the low incidence rate of Coccidioidomycosis in Tuolumne County, and with the project’s implementation of SDF-AQ-2, it is not anticipated that earth-moving activities during construction would result in exposure of nearby sensitive receptors to Valley Fever. Therefore, the project would have a **less-than-significant** impact with respect to Valley Fever exposure for sensitive receptors.

Naturally Occurring Asbestos

As described in Chapter 3.6, Geology and Soils, within this EIR, the Tuolumne Facility is underlain by serpentinized ultramafic rock. NOA is most commonly found where ultramafic rock or serpentinite rock is present. When construction activities occur in areas with naturally occurring asbestos in the soils or rock, the asbestos fibers can become airborne and may be inhaled, which can cause chronic local inflammation and disrupt orderly cell division, both of which can facilitate the development of asbestosis (a noncancerous lung disease involving fibrotic scarring of the lungs) and cancer (OEHHA 2000). NOA may therefore be present in the rock underlain by the Tuolumne Facility, and the project would consequently implement SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton) to reduce fugitive dust during construction of the Tuolumne Facility. However, the impact of NOA on sensitive receptors would be **potentially significant.**

The project would implement **MM-AQ-13** (Construction Asbestos, Serpentinite, and Ultramafic Rock Management Plan (ASUR Plan) – Tuolumne Facility), which incorporates measures designed to minimize the emissions of asbestos-containing dust from project activity. **MM-AQ-13** requires that, prior to any grading activities, a geologic evaluation shall be conducted to determine if naturally occurring asbestos is present within the area that will be disturbed. If naturally occurring asbestos is found at the site, GSNR must comply with all requirements outlined in the Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations (17 CCR 93105) and the Airborne Toxic Control Measure for (17 CCR 93106). These requirements shall include but are not limited to:

1. Development of an Asbestos Dust Mitigation Plan, which must be approved by the Tuolumne County Air Pollution Control District before operations begin; and
2. Development and approval of an Asbestos Health and Safety Program.

Implementation of **MM-AQ-13** (Construction Asbestos, Serpentinite, and Ultramafic Rock Management Plan (ASUR Plan) – Tuolumne Facility) would minimize any potential asbestos in dust. As a result, the project would not expose sensitive receptors to NOA and this impact would be **less than significant with mitigation.**

Transport to Market

Port of Stockton

Toxic Air Contaminants

Construction Health Risk

As discussed in Section 3.2.4.1.2, the project would emit TAC's during construction. An HRA was performed to evaluate potential cancer and non-cancer health risk impacts to sensitive receptors proximate to the site. Table 3.2-83 shows the unmitigated HRA results during construction.

Table 3.2-83. Port of Stockton Construction Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	5.0	20	Less than Significant
Chronic Hazard Index – Residential	Index Value	0.01	1.0	Less than Significant

Source: San Joaquin Valley APCD 2015.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-83, cancer and chronic risk during construction would not exceed the San Joaquin Valley APCD threshold.

Operational Health Risk

As discussed in Section 3.2.4.1.2, the project would emit TAC's during operation from combustion sources. An HRA was performed to evaluate potential cancer and non-cancer health risk impacts to sensitive receptors proximate to the site. Table 3.2-84 shows the unmitigated HRA results during operation.

Table 3.2-84. Port of Stockton Operation Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	10.4	20	Less than Significant
Chronic Hazard Index – Residential	Index Value	0.002	1.0	Less than Significant

Source: San Joaquin Valley APCD 2015.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-84, cancer and chronic risk during operation would not exceed the San Joaquin Valley APCD threshold. Impacts would be less than significant.

Combined Health Risk

The sensitive receptors proximate to the site would be exposed to TACs during construction and operation as discussed above. As such, for disclosure purposes, the construction and operational health risk impacts were combined at the maximally exposed receptor. The unmitigated combined health risk impacts of the project are shown in Table 3.2-85 below.

Table 3.2-85. Port of Stockton Combined Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	10.7	20	Less than Significant
Chronic Hazard Index – Residential	Index Value	0.01	1.0	Less than Significant

Source: San Joaquin Valley APCD 2015.
Note: CEQA = California Environmental Quality Act.
See Appendix B4.

As shown in Table 3.2-85, combined cancer and chronic non-cancer risk would not exceed the San Joaquin Valley APCD thresholds. Impacts would be less than significant. While not required to reduce potential health risk impacts, **MM-AQ-8** and **MM-AQ-11** would reduce emissions of DPM during operation, which are quantified. **MM-AQ-3**, which is not quantified herein, would reduce DPM by incorporating renewable diesel. Table 3.2-86 shows the combined construction and operational HRA results including **MM-AQ-8** and **MM-AQ-11**.

Table 3.2-86. Port of Stockton Combined Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential	Per Million	10.6	20	Less than Significant
Chronic Hazard Index – Residential	Index Value	0.01	1.0	Less than Significant

Source: San Joaquin Valley APCD 2015.

Note: CEQA = California Environmental Quality Act.
See Appendix B4.
The values shown include quantification of **MM-AQ-8** (Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockton) and **MM-AQ-11** (Operational Switcher Exhaust Minimization – Port of Stockton).

As shown in Table 3.2-86, combined cancer and chronic non-cancer risk would not exceed the San Joaquin Valley APCD thresholds with mitigation. Impacts would be less than significant.

Carbon Monoxide Hotspots

Construction of the Port of Stockton Facility would generate localized emissions of CO at the facility site, primarily from offroad equipment and construction worker vehicles, vendor trucks, and haul trucks. These impacts would be short-term in nature lasting only during the duration of construction. During operations, the Port of Stockton Facility would generate localized emissions of CO at the facility site from area sources, mobile sources, off-road equipment, and stationary sources, as described in Section 3.2.4.1.3. As indicated in Tables 3.2-55, 3.2-60, and 3.2-63, these emissions would not exceed the San Joaquin Valley APCD threshold of significance for CO, and would not exceed any applicable ambient air quality standard for CO during either construction or operations.

With respect to traffic-related localized CO impacts, the San Joaquin Valley APCD *Guidance for Assessing and Mitigating Air Quality Impacts* states that a quantitative CO hotspots analysis be performed if either of the following two conditions exist: (1) a traffic study for the proposed project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the proposed project vicinity would be reduced to LOS E or F; or (2) a traffic study indicates that the proposed project would substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the project vicinity.

Construction of the Port of Stockton facility would have trip generation associated with construction worker vehicles, vendor trucks, and haul trucks. This traffic, and any localized emissions of CO occurring along the route, would be short-term in nature lasting only during the duration of construction. As noted in the discussions of the Lassen and Tuolumne facilities above, traffic volumes associated with construction of a facility of this size are a small fraction of the amounts found not to generate traffic-related CO "hot spots in the SCAQMD analysis. With respect to operational vehicle trips, , As described in the Transportation Section, 3.14.4.2, the addition of the GSNR facility would add approximately eight (8) daily employees, four (4) in the day shift, and two (2) each in the swing shift and night shift, generating approximately 16 daily trips. (If stevedores are included, this number would increase slightly to 32 daily trips.) Due to the minimal number of daily trips that would not all occur concurrently with peak-hour traffic, the project would have a negligible impact to the transportation network. Furthermore, because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SJVAB is steadily decreasing. As such, construction and operation of the Port of Stockton facility would not result in a CO hotspot or the potential to result in CO emissions that when totalled with the ambient concentrations would exceed the CO CAAQS. This impact would be **less than significant.**

Valley Fever Exposure

As described in Section 3.2.1.1.2, Valley Fever is not highly endemic to San Joaquin County, and within San Joaquin County, the incidence rate is below the statewide average. Construction of the Port of Stockton Facility would be required to comply with San Joaquin Valley APCD Regulation VIII Rule 8201, which would limit fugitive dust emissions from construction, demolition, excavation, extraction, and other earthmoving activities. The rule outlines Dust Control Plan requirements for certain applicable construction activities. Furthermore, construction of the Port of Stockton facility would implement SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton) to reduce fugitive dust during construction. SDF-AQ-2 implements a dust control plan that includes requirements of watering exposed areas 3 times per day, watering demolished areas twice daily, watering unpaved roads twice daily, and limiting vehicle speeds to 15 mph on unpaved roads. The nearest off-site sensitive receptor is located 1,024 feet away from the Port. Based on the low incidence rate of Coccidioidomycosis in Tuolumne County, and with the project's implementation of SDF-AQ-2, it is not anticipated that earth-moving activities during construction would result in exposure of nearby sensitive receptors to Valley Fever. Therefore, the project would have a **less-than-significant** impact with respect to Valley Fever exposure for sensitive receptors.

Naturally Occurring Asbestos

The Port of Stockton site is not underlain by ultramafic or serpentine rock. Therefore, it is not expected that the Port of Stockton would contain NOA. Furthermore, the project would implement SDF-AQ-2, which would reduce project-generated construction dust. Therefore, the impact of NOA on sensitive receptors would be **less than significant.**

Stockton Community Emissions Reduction Program

As described in Section 3.2.2.3, the City of Stockton's CERP outlines strategies to reduce emissions in the community (San Joaquin Valley APCD 2021). The strategy applicable to the project is FD.1, Enhanced Enforcement of District Regulation VIII Fugitive Dust Requirements. The goal of this strategy is to limit the potential for localized air quality impacts associated with fugitive dust from construction and earthmoving activities and open areas subject to San Joaquin Valley APCD Regulation VIII. The project would be required to comply with San Joaquin Valley APCD Regulation VIII (Fugitive PM_{10} Prohibition) by law, which specifies standard construction practices to reduce fugitive dust emissions. Pursuant to Regulation VIII, Rule 8021, Section 6.3, the project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan, which would reduce fugitive dust impacts to less than significant for proposed project construction. Project compliance with San Joaquin Valley APCD Regulation VIII and the Stockton CERP strategy FD.1 is further supported by implementation of SDF-AQ-1 (Air District Regulatory Compliance – Lassen Facility, Tuolumne Facility, and Port of Stockton), which would require the project to comply with air district regulations, and SDF-AQ-2 (Construction Fugitive Dust Control Plans – Lassen Facility, Tuolumne Facility, and Port of Stockton), which would reduce project-generated construction dust. Overall, the project would meet the applicable reduction measures outlined within the Stockton CERP to reduce emissions and potential health risk on sensitive groups.

Conclusion

Because implementation of the project would result in exposure to TACs during certain construction (Tuolumne Facility) and operational (Lassen Facility and Tuolumne Facility) activities, impacts associated with the potential for the project to expose sensitive receptors to substantial pollutant concentrations are **significant and unavoidable.**

Impact AQ-4 The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Based on available information, the project is not anticipated to result in other emissions that have not been addressed under Thresholds AQ-1, AQ-2, and AQ-3. As such, this analysis focuses on the potential for the project to generate odors. 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 and cause distress among the public and generate citizen complaints.

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

Common sources of odors include manufacturing plants, rendering plants, coffee roasters, wastewater treatment plants, sanitary landfills, and solid waste transfer stations. The project includes pellet manufacturing plants at the Lassen and Tuolumne Facilities. SDF-AQ-3 (Operational Odor Control – Lassen Facility and Tuolumne Facility) which would require GSNR to implement an Odor Abatement Plan (OAP) at both facility sites. SDF-AQ-3 would include a contact person responsible for logging odor complaints, policy and procedure describing the actions to be taken when an odor compliant is received, description of potential odors and methods for reducing potential odors, and contingency measures to curtail emissions in the event of a complaint.

With incorporation of SDF-AQ-3, the project is not expected to create substantial objectionable odors affecting a substantial number of people. Furthermore, the project would be subject to the applicable Nuisance rules of the Lassen County APCD (Rule 4:2), Tuolumne County APCD (Rule 205), and San Joaquin Valley APCD (Rule 4102). Therefore, project operations would result in an odor impact that is **less than significant.**

3.2.4.3 Cumulative Impacts

The geographic scope of the area potentially affected by cumulative air quality impacts consists of the air basins the activities would occur in for impacts related to mass construction emissions and operational emissions, in particular mobile sources (i.e., vehicle trips). This geographic scope was selected because emissions from construction and operational activities can contribute to exceedances in criteria air pollutant concentrations, which are measured and regulated by air districts based on the air basin. The project and the related projects are all located within the air basins the activities would occur in. Regional growth in the applicable air basins, as established in general plans and regional plans produced by the applicable metropolitan planning organization would also contribute to cumulative air quality impacts in the categories of construction emissions and mobile source emissions.

Other aspects of air quality impacts are more localized (TAC emissions, impacts to sensitive receptors, and odor emissions). For these impacts, the geographic scope of the area potentially affected by cumulative impacts consists of the project’s immediate vicinity. This geographic scope was selected because impacts in the categories of TACs, sensitive receptors, and odors dissipate quickly with distance and affect adjacent and nearby land uses. As such, the project could combine with related projects in the immediate vicinity (e.g., within 1,000 feet) to produce a cumulative impact.

Impact AQ-1 The project would potentially contribute to cumulative impacts causing a conflict with or obstructing implementation of the applicable air quality plan.

As discussed in Section 3.2.4.2, Impact AQ-1, as recommended by California air districts, there are two general ways to determine the potential for a project to conflict with the applicable air quality plan(s): (1) consistency with the underlying land use designations (e.g., General Plan designation), and (2) potential to exceed numeric thresholds established to determine if a project would result in a significant air quality impact.

The project would not conflict with the underlying land use designations, and therefore, it would not conflict with the first criteria to conflict with the applicable air quality plans. The project's construction-source emissions would not exceed applicable regional thresholds after implementation of PDFs and mitigation measures. However, the project's operational-source emissions would result in exceedances of regional thresholds for emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$, even after implementation of PDFs and mitigation. As such, the project would conflict with the second criteria to conflict with the applicable air quality plans.

Because activities implemented under the project would generate levels of criteria air pollutants and precursors that are anticipated to exceed air district thresholds, these emissions could result in, or contribute to, exceedances of the NAAQS and CAAQS for criteria air pollutants (specifically VOC and NO_x that contribute to ozone, PM_{10}, and $PM_{2.5}$) thereby also potentially conflicting with the air quality planning efforts of regional air districts (including but not limited to Lassen County APCD, Tuolumne County APCD, and San Joaquin Valley APCD), including those that comprise the SIP. As such, impacts associated with the potential for the project would conflict with or obstruct implementation of the applicable air quality plan are significant and unavoidable.

Based on the above considerations, the impact of the project would constitute a potentially significant cumulative impact related to air quality plan implementation with mitigation. Therefore, the Project would contribute to a **cumulatively considerable and significant** impact related to conflicting with the applicable air quality plans.

Impact AQ-2 — The project would potentially result in a cumulatively considerable impact resulting in a net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

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 air districts develop and implement plans for future attainment of ambient air quality standards. The potential for the project to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable NAAQS and/or CAAQS, is addressed in Section 3.2.4.2, Project Impacts. As set forth therein, the project would exceed Lassen County APCD daily BACT construction thresholds for VOC and NO_X, before mitigation, but with mitigation incorporated would reduce impacts to a less than significant level. The project's construction emissions at the Port of Stockton would be less than significant compared to San Joaquin Valley APCD thresholds. However, the project would result in construction activities at the Tuolumne Facility that would exceed the AAQS for the 1-hour NO_2, 24-hour and annual PM_{10} and $PM_{2.5}$ with application of mitigation. As such, the potential cumulative impact related to construction emissions of criteria pollutants would be **cumulatively considerable and significant.**

The project would exceed operational thresholds for VOC, NO_X, CO, $PM_{2.5}$ and PM_{10} emissions in multiple air districts, and even with the incorporation of mitigation, would result in significant and unavoidable impacts. Furthermore, the Lassen Facility, Tuolumne Facility, and Port of Stockton would result in operational activities that would generate ambient concentrations of criteria pollutants above the applicable thresholds with mitigation. Thus, the project's cumulative impacts related to operational emissions with respect to the potential to result in a cumulatively considerable net increase in any nonattainment criteria air pollutant would be **cumulatively considerable and significant.**

Impact AQ-3 The project would potentially contribute to cumulative impacts that would expose sensitive receptors to substantial pollutant concentrations.

Construction and operational HRAs were performed to estimate the Maximum Individual Cancer Risk and the Chronic and Acute Hazard Indexes for proximate residential receptors from exposure to project-generated TACs. For disclosure purposes, the construction and operational health risk impacts were combined at each receptor to determine the maximally exposed combined receptor. The results found that the combined cancer risk would be significant and unavoidable at the Lassen Facility and the Tuolumne Facility with mitigation. The combined cancer risk would be less than significant at the Port of Stockton.

Operation of the project would not expose sensitive receptors to localized high concentrations of CO at the Lassen Facility, Tuolumne Facility, or Port of Stockton sites with implementation of feasible mitigation measures. As such, potential construction or operational CO hotspot impacts would be less than significant.

The pellet facilities and the Port of Stockton terminal are not located in highly endemic counties for Valley Fever, but they would also implement SDFs to comply with air district guidance and reduce fugitive dust emissions to minimize risk of airborne fungal spores, and the impact would be less than significant without mitigation. During feedstock acquisition, the project would also implement PDFs that would require compliance with air district guidance in order to reduce fugitive dust emissions and reduce the risk of airborne fungal spores. However, feedstock acquisition could take place in counties that are highly endemic for Valley Fever. Therefore, the project would have a potentially significant impact with respect to Valley Fever exposure for sensitive receptors prior to mitigation. The project would implement **MM-AQ-11** (Operational Valley Fever Exposure Minimization – Feedstock Acquisition), which would require GSNR to implement additional dust control when operating in highly endemic counties (Madera, Merced, Fresno, and Tulare) and a worker training program. As a result, the impact of Valley Fever exposure to sensitive receptors would be less than significant with mitigation.

The Lassen Facility and the Port of Stockton terminal are not located on sites with rocks that could include NOA, and the impact would be less than significant without mitigation. The Tuolumne Facility is underlain by serpentinized ultramafic rock, where NOA is most commonly found. While it is unknown if NOA is present in the rock underlain by the Tuolumne Facility, the project would implement SDF-AQ-2 to reduce fugitive dust during construction of the Tuolumne Facility. However, the impact of NOA on sensitive receptors would be potentially significant. The project would implement **MM-AQ-13** (Construction Asbestos, Serpentinite, and Ultramafic Rock Management Plan (ASUR Plan) – Tuolumne Facility), which incorporates measures designed to minimize the emissions of asbestos-containing dust from project activity, and the impact would be less than significant with mitigation. During feedstock acquisition, the project would also implement PDF-AQ-3 (), which would require treatment crews to avoid ground-disturbance in areas identified as likely to contain NOA and to follow any NOA-related guidance provided by the applicable local air district. As a result, the impact of naturally occurring asbestos exposure to sensitive receptors would be less than significant with mitigation.

As such, the potential cumulative impact related to exposure of sensitive receptors would be **cumulatively considerable and significant.**

Impact AQ-4 The project would not contribute to cumulative impacts that would result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Odor impacts are generally limited to the immediate areas surrounding the sources. During construction, odors would disperse rapidly from each project site during construction. During operation, the project would implement

SDF-AQ-3 (Operational Odor Control – Lassen Facility and Tuolumne Facility) which would require an OAP at the Lassen and Tuolumne Facilities. With incorporation of SDF-AQ-3, the project is not expected to create substantial objectionable odors affecting a substantial number of people. Furthermore, the project would be subject to the applicable Nuisance rules of the Lassen County APCD (Rule 4:2), Tuolumne County APCD (Rule 205), and San Joaquin Valley APCD (Rule 4102). Therefore, project impacts would **not be cumulatively considerable.**

3.2.4.4 Mitigation Measures

MM-AQ-1 Operational Equipment Exhaust Minimization – Tier 4 Final – Feedstock Acquisition. During operation of feedstock acquisition activities, California Air Resources Board (CARB)-certified Tier 4 Final engines shall be used for all diesel-powered equipment pieces that are 50 horsepower or greater.

In the event of changed circumstances (e.g., changes in the availability of specific types of equipment), GSNR may submit a request to the Executive Director of GSFA to apply an equivalent method that, at a minimum, would meet the anticipated criteria air pollutant emission levels after implementation of this mitigation measure (i.e., estimated criteria air pollutants assuming all diesel-powered equipment pieces that are 50 horsepower or greater equipped with CARB-certified Tier 4 Final engines). Documentation using industry-standard emission estimation methodologies supporting the alternative method request shall be furnished to the Executive Director of GSFA. The Executive Director of GSFA may approve the alternate method request at their discretion.

In addition, before an exemption may be granted, GSNR shall demonstrate that at least three vendors in County of activity were contacted and that those vendors confirmed Tier 4 Final equipment could not be located within the applicable County. Required equipment fleet and methodologies approved by the Executive Director of GSFA shall be included as enforceable terms in any contract or subcontract by GSNR for these activities.

MM-AQ-1 is quantified in the analysis.

MM-AQ-2 Construction and Operation Limit Truck and Equipment Idling – Feedstock Acquisition, Lassen Facility, and Tuolumne Facility. During construction and operation, GSNR shall reduce idling time of heavy-duty trucks either by requiring them to be shut off when not in use or limiting the time of idling to no more than 3 minutes (thereby improving upon the 5-minute idling limit required by the state airborne toxics control measure, 13 CCR 2485). These requirements shall be included as enforceable terms in any contract or subcontract by GSNR for these activities and GSNR shall post clear signage reminding workers to limit idling of construction equipment and heavy-duty trucks.

MM-AQ-2 is not quantified in the analysis.

MM-AQ-3 Construction and Operation Renewable Diesel Fuel – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton. During construction and operation, GSNR shall use renewable diesel fuel in diesel-powered off-road equipment and diesel trucks during construction and operation whenever commercially available. Renewable diesel fuel must meet the following criteria:

- Meet California's Low Carbon Fuel Standards and be certified by CARB Executive Officer;
- Be hydrogenation-derived (reaction with hydrogen at high temperatures) from 100% biomass material (i.e., non-petroleum sources), such as animal fats and vegetables;
- Contain no fatty acids or functionalized fatty acid esters; and
- Have a chemical structure that is identical to petroleum-based diesel and complies with American Society for Testing and Materials D975 requirements for diesel fuels to ensure compatibility with all existing diesel engines.

Commercially available is herein defined as renewable diesel fuel sourced within 50 vehicle miles of the project/activity site and within 10% of the cost of the equivalent nonrenewable fuel. GSNR or its contractor or subcontractor performing these services must contact at least three vendors within the County of activity and submit to GSFA justification if the renewable diesel fuel is not commercially available. These requirements shall be included as enforceable terms in any contract or subcontract by GSNR for these activities.

MM-AQ-3 is not quantified in the analysis.

MM-AQ-4 Construction and Operational Worker Commute Optimization – Feedstock Acquisition, Lassen Facility, Tuolumne Facility, and Port of Stockton. GSNR or its designee will provide educational materials to encourage workers to carpool to work sites and/or use public transportation for their commutes.

MM-AQ-4 is not quantified in the analysis.

Note that MM-TRF-1 includes providing employee sponsored vanpool for sustainable forest management projects and MM-TRF-4 includes providing electric vehicle charging infrastructure and employee sponsored vanpool for the Lassen Facility, Tuolumne Facility, and Port of Stockton, which would further reduce mobile source emissions and support MM-AQ-4, which focuses on providing educational materials to encourage carpool or use public transportation for all key project activities.

MM-AQ-5 Construction Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility. Prior to the commencement of construction activities for the Lassen Facility, GSNR shall require its construction contractor to use California Air Resources Board (CARB)-certified Tier 4 Final engines for all diesel-powered equipment pieces that are 50 horsepower or greater throughout all phases of construction.

In the event of changed circumstances (e.g., changes in the availability of specific types of construction equipment), GSNR may submit a request to the Executive Director of GSFA to apply an equivalent method of achieving project-generated construction emissions that fall below the numeric emissions standards established by the Lassen County Air Pollution Control District (Lassen County APCD) Rule 6:4 Best Available Control Technology (BACT) Requirements and the Lassen County APCD cancer risk threshold. Documentation using industry-standard emission estimation methodologies supporting the alternative method request shall be furnished to the Executive Director of GSFA. The Executive Director of GSFA may approve the alternate method request at their discretion.

In addition, before an exemption may be granted, the construction contractor shall demonstrate that at least three construction fleet owners/operators in Lassen County were contacted and that those owners/operators confirmed Tier 4 Final equipment could not be located within Lassen County during the desired construction schedule. Required construction equipment fleet and methodologies approved by the Executive Director of GSFA shall be included as enforceable terms in any contract or subcontract by GSNR for these activities.

MM-AQ-5 is quantified in the analysis.

MM-AQ-6 Construction Lower-VOC Paints – Lassen Facility. During construction, the project shall use lower volatile organic compound (VOC) paint, defined as 200 grams per liter VOC or less for the purposes of this mitigation measure, for all interior and exterior paint applications for nonresidential land uses. These requirements shall be included as enforceable terms in any contract or subcontract by GSNR for these activities.

MM-AQ-6 is quantified in the analysis.

MM-AQ-7 Construction Activities Notification – Lassen Facility, Tuolumne Facility, and Port of Stockton. Prior to the commencement of any construction activities, GSNR or its designee shall designate a construction relations officer who will address community concerns regarding on-site construction activity. GSNR shall provide public notification in the form of a visible sign containing the contact information of the construction relations officer, who shall document complaints and concerns regarding on-site construction activity. The sign shall be placed in easily accessible locations along nearby roadways and noted on grading and improvement plans.

MM-AQ-7 is not quantified in the analysis.

MM-AQ-8 Operational Equipment Exhaust Minimization – Tier 4 Final – Lassen Facility, Tuolumne Facility, and Port of Stockon. California Air Resources Board (CARB)-certified Tier 4 Final engines shall be used for all diesel-powered equipment pieces that are 50 horsepower or greater.

In the event of changed circumstances (e.g., changes in the availability of specific types of equipment), GSNR may submit a request to the Executive Director of GSFA to apply an equivalent method that, at a minimum, would meet the anticipated criteria air pollutant emission levels, including exhaust coarse particulate matter (PM_{10}) used as a surrogate for diesel particulate matter, after implementation of this mitigation measure (i.e., estimated criteria air pollutants assuming all diesel-powered equipment pieces that are 50 horsepower or greater equipped with CARB-certified Tier 4 Final engines). Documentation using industry-standard emission estimation methodologies supporting the alternative method request shall be furnished to the Executive Director of GSFA. The Executive Director of GSFA may approve the alternate method request at their discretion.

In addition, before an exemption may be granted, GSNR shall demonstrate that at least three vendors in the county of activity (i.e., Lassen County for Lassen Facility, Tuolumne County for Tuolumne Facility, and San Joaquin County for the Port of Stockton) were contacted and that those vendors confirmed Tier 4 Final equipment could not be located within the county of activity. Required construction equipment fleet and methodologies approved by the Executive Director of

GSFA shall be included as enforceable terms in any contract or subcontract by GSNR for these activities.

MM-AQ-8 is quantified in the analysis.

MM-AQ-9 Operational Switcher Locomotive Exhaust Minimization – Lassen Facility. During operation of the Lassen Facility, California Air Resources Board (CARB)-certified Tier 4-Final engine shall be used for the on-site switcher locomotive at the Lassen Facility.

This measure can also be achieved by using battery-electric locomotive as it becomes commercially available in Lassen County.

MM-AQ-9 is quantified in the analysis.

MM-AQ-10 Construction Equipment Exhaust Minimization – Tier 4 Final – Tuolumne Facility. Prior to the commencement of construction activities for the Tuolumne Facility, GSNR shall require its construction contractor to use California Air Resources Board (CARB)-certified Tier 4 Final engines for all diesel-powered equipment pieces that are 50 horsepower or greater throughout all phases of construction.

In the event of changed circumstances (e.g., changes in the availability of specific types of construction equipment), GSNR may submit a request to the Executive Director of GSFA to apply an equivalent method that, at a minimum, would meet the anticipated criteria air pollutant emission levels, including exhaust coarse particulate matter (PM_{10}) used as a surrogate for diesel particulate matter, after implementation of this mitigation measure (i.e., estimated criteria air pollutants assuming all diesel-powered equipment pieces that are 50 horsepower or greater equipped with CARB-certified Tier 4 Final engines). Documentation using industry-standard emission estimation methodologies supporting the alternative method request shall be furnished to the Executive Director of GSFA. The Executive Director of GSFA may approve the alternate method request at their discretion.

In addition, before an exemption may be granted, GSNR shall demonstrate that at least three fleet owners/operators in Tuolumne County were contacted and that those fleet owners/operators confirmed Tier 4 Final equipment could not be located within Tuolumne County during the desired construction schedule.

Required construction equipment fleet and methodologies approved by the Executive Director of GSFA shall be included as enforceable terms in any contract or subcontract by GSNR for these activities.

MM-AQ-10 is quantified in the analysis.

MM-AQ-11 Operational Switcher Exhaust Minimization – Port of Stockton. If approved by the Port and its rail operator, GSNR will use a California Air Resources Board (CARB)-certified Tier 4-Final engine for the on-site switcher at the Port of Stockton.

This measure can also be achieved by using battery-electric switchers as it becomes available.

MM-AQ-11 is not quantified in the analysis.

MM-AQ-12 Operational Valley Fever Exposure Minimization – Feedstock Acquisition. Prior to any ground disturbance activities within Madera, Merced, Fresno, and Tulare Counties, which are counties of potential project activity where Valley Fever is highly endemic, GSNR shall implement the following Valley Fever Provisions:

1) Between June 1 and November 30, when Valley Fever rates of infection are the highest, additional dust suppression measures (such as additional water or the application of additional soil stabilizer) will be implemented prior to and immediately following ground disturbing activities if wind speeds exceed 15 mph or temperatures exceed 95°F for 3 consecutive days. The additional dust suppression will continue until winds are 10 mph or lower and outdoor air temperatures are below 90°F for at least 2 consecutive days. The additional dust suppression measures will be incorporated into the Dust Control Plan.
2) Prior to any project forest treatment activity, GSNR will prepare and implement a worker training program that describes potential health hazards associated with Valley Fever, common symptoms, proper safety procedures to minimize health hazards, and notification procedures if suspected work-related symptoms are identified during operation. The worker training program will identify safety measures to be implemented by GSNR or its contractor during operation. Safety measures will include the following:
   - Provide HEPA-filtered air-conditioned enclosed cabs on heavy equipment. Train workers on proper use of cabs, such as turning on air conditioning prior to using the equipment.
   - Provide communication methods, such as two-way radios, for use by workers in enclosed cabs.
   - Provide personal protective equipment (PPE), such as half-mask and/or full-mask respirators equipped with particulate filtration, to workers active in dusty work areas.
   - Provide separate, clean eating areas with hand-washing facilities for workers.
   - Clean equipment, vehicles, and other items before they are moved off site to other work locations.
   - Provide training for workers so they can recognize the symptoms of Valley Fever and promptly report suspected symptoms of work-related Valley Fever to a supervisor.
   - Direct workers that exhibit Valley Fever symptoms to immediately seek a medical evaluation.

MM-AQ-12 is not quantified in the analysis.

MM-AQ-13 Construction Asbestos, Serpentinite, and Ultramafic Rock Management Plan (ASUR Plan) – Tuolumne Facility. Prior to any grading activities, a geologic evaluation shall be conducted to determine if naturally occurring asbestos is present within the area that will be disturbed. If naturally occurring asbestos is not present, a notice of exemption must be filed with the Tuolumne County Air Pollution Control District. If naturally occurring asbestos is found at the site, GSNR must comply with all requirements outlined in the Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. These requirements shall include but are not limited to:

1) Development of an Asbestos Dust Mitigation Plan, which must be approved by the Tuolumne County Air Pollution Control District before operations begin; and
2) Development and approval of an Asbestos Health and Safety Program.

MM-AQ-13 is not quantified in the analysis.

3.2.4.5 Significance After Mitigation

Impact AQ-1 The project would conflict with or obstruct implementation of the applicable air quality plan.

Because activities implemented under the project would generate levels of criteria air pollutants and precursors that are anticipated to exceed air district thresholds, these emissions could result in, or contribute to, exceedances of the NAAQS and CAAQS for criteria air pollutants (specifically VOC and NO_x that contribute to ozone, CO, PM_{10}, and $PM_{2.5}$) thereby also potentially conflicting with the air quality planning efforts of regional air districts (including but not limited to Lassen County APCD, Tuolumne County APCD, and San Joaquin Valley APCD), including those that comprise the SIP. Implementation of **MM-AQ-1** through **MM-AQ-10** would reduce impacts; however, impacts associated with the potential for the project would conflict with or obstruct implementation of the applicable air quality plan would remain **significant and unavoidable.**

Impact AQ-2 The project would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

Construction of the Lassen Facility would exceed the criteria pollutant thresholds established by Lassen County APCD for VOC and NO_x emissions. **MM-AQ-2** through **MM-AQ-7** would reduce criteria air pollutant emissions and impacts during construction. After implementation of mitigation, regional construction emissions would not exceed the applicable Lassen County APCD BACT thresholds of significance for any criteria pollutant, and impacts would be less than significant with mitigation. Construction of the Tuolumne Facility would generate ambient concentrations of criteria pollutants above the applicable thresholds. **MM-AQ-2** through **MM-AQ-4**, **MM-AQ-7**, and **MM-AQ-10** would reduce impacts; however, regional construction emissions would still exceed the AAQS for the 1-hour NO_2, 24-hour and annual PM_{10} and $PM_{2.5}$ and would generate ambient concentrations of criteria pollutants above the thresholds, resulting in a significant and unavoidable impact with mitigation. Construction of the Port of Stockton would not exceed the criteria air pollutant thresholds established by the San Joaquin Valley APCD, and the impact would be less than significant.

During feedstock acquisition, the project would exceed the numerical thresholds of significance established by multiple air districts. With incorporation of **MM-AQ-1** through **MM-AQ-4**, the project would still exceed the numerical thresholds of significance established by Butte County AQMD, Calaveras County APCD, El Dorado APCD, Feather River AQMD, Lassen County AQMD, Northern Sierra AQMD, Placer County APCD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD, Shasta County AQMD, and Tehama County APCD for NO_X, CO, PM_{10}, and $PM_{2.5}$, resulting in a significant and unavoidable impact with mitigation.

Prior to mitigation, operation at the Lassen Facility would exceed the daily Lassen County APCD BACT thresholds for VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$. Implementation of **MM-AQ-2** through **MM-AQ-4**, **MM-AQ-8**, and **MM-AQ-9** would reduce criteria air pollutants and impacts; however, the project would still exceed the daily Lassen County APCD thresholds for VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$ and the AAQS for the 1-hour NO_2, 24-hour and annual PM_{10} and $PM_{2.5}$ with mitigation. However, Lassen County is designated as attainment or unclassified for all criteria air pollutants, including NO_2, PM_{10}, and $PM_{2.5}$, under both CAAQS and NAAQS. Lassen County is not nonattainment for any of these pollutants, or for O_3, and therefore the impact related to this portion of the project is less than significant.

Prior to mitigation, operation at the Tuolumne Facility would exceed the annual Tuolumne County APCD threshold for CO. Implementation of **MM-AQ-2** through **MM-AQ-4**, and **MM-AQ-8** would reduce criteria air pollutants and impacts; however, the project would still exceed the annual Tuolumne County APCD threshold for CO with mitigation and the AAQS for the 1-hour NO_2, 24-hour and annual PM_{10}, and $PM_{2.5}$, resulting in a significant and unavoidable impact with mitigation.

Prior to mitigation, operation at the Port of Stockton would exceed the annual San Joaquin Valley APCD threshold for NO_x. Implementation of **MM-AQ-3**, **MM-AQ-4**, **MM-AQ-8**, and **MM-AQ-11** would reduce criteria air pollutants and impacts; however, the project would still exceed the annual San Joaquin Valley APCD threshold for NO_x with mitigation and the AAQS for the annual $PM_{2.5}$, resulting in a significant and unavoidable impact with mitigation.

Line haul rail transport emissions would exceed the Northern Sierra AQMD, Butte County AQMD, Feather River AQMD and Sacramento Metropolitan AQMD thresholds for NO_X. Ship transport would exceed the San Joaquin Valley APCD and BAAQMD thresholds for NO_X. These impacts would be significant and unavoidable and there are no feasible mitigation measures.

Overall, this impact would be **significant and unavoidable.**

Impact AQ-3 The project would potentially expose sensitive receptors to substantial pollutant concentrations.

Health risk during construction of the Lassen Facility would be less than significant with implementation of **MM-AQ-2** through **MM-AQ-5.** Health risk during operation of the Lassen Facility would be significant and unavoidable with application of **MM-AQ-2**, **MM-AQ-3**, **MM-AQ-8**, and **MM-AQ-9.** Similarly, the combined construction and operational health risk would be significant and unavoidable with mitigation.

Health risk during construction of the Tuolumne Facility would be significant and unavoidable with implementation of **MM-AQ-2**, **MM-AQ-3**, and **MM-AQ-10.** Health risk during operation of the Tuolumne Facility would be significant and unavoidable with application of **MM-AQ-2**, **MM-AQ-3**, and **MM-AQ-8.** Similarly, the combined construction and operational health risk would be significant and unavoidable with mitigation.

Potential health risk during feedstock acquisition and construction and operation of the Port of Stockton would be less than significant prior to mitigation.

Construction of the Lassen Facility, the Tuolumne Facility, and the Port of Stockton would result in a less than significant impact CO hotspot impact. Operation of the project would result in a less than significant impact to CO hotspots at the Lassen Facility, Tuolumne Facility, and Port of Stockton sites .

Impacts associated with valley fever exposure for sensitive receptors at the Lassen Facility, Tuolumne Facility, and the Port of Stockton without mitigation. During feedstock acquisition, the project would implement **MM-AQ-12**; therefore, the impact of Valley Fever exposure would be less than significant with mitigation.

Feedstock acquisition, the Lassen Facility, and the Port of Stockton project components would result in a less than significant impact on NOA without mitigation. The Tuolumne Facility would implement **MM-AQ-13**, which would result in a less than significant impact on NOA with mitigation.

This impact would be less than significant, with the exception of a **significant and unavoidable** impact for the construction phase of the Lassen and Tuolumne facilities.

Impact AQ-4 The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Impacts would be **less than significant** without mitigation.

3.2.5 Additional Air Quality Considerations

3.2.5.1 Lifecycle Criteria Air Pollutant Analysis

Purpose

CEQA is intended to inform government decisionmakers and the public about the potential environmental effects of proposed activities and to prevent significant, avoidable environmental damage. An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure. (CEQA Guidelines, § 15151).

The extent of an evaluation and analysis of environmental impacts in an EIR is guided by a rule of reason (Save Round Valley Alliance v. County of Inyo (2007) 157 Cal.App 4th 1437, 1467). The level of specificity required is likewise determined by the nature of the project and the rule of reason (Al Larson Boat Shop, Inc. v. Board of Harbor Commissioners (1993) 18 Cal.App.4th 729, 741–742). Further, an EIR is not required to engage in speculative analysis. (CEQA Guidelines, § 15145.) "Common sense" applies, and "is an important consideration at all levels of CEQA review." (*Save the Plastic Bag Coalition v. City of Manhattan Beach* 2011).

Applying these principles, there is a "distinction between local impacts and impacts in areas outside the public agency's geographical boundaries. CEQA specifies that a public agency must consider any significant effect on the environment in the area affected by the project. Although…public agencies must consider effects a project will have beyond the boundaries of the project area…CEQA does not require an exhaustive analysis of all conceivable impacts a project may have in areas outside its geographical boundaries…broader environmental impacts without direct impact on the local agency's geographical area may be evaluated at a higher level of generality (Save the Plastic Bag Coalition v. County of Marin (2014) 218 Cal.App.4th 209, 221-223). "That the effects will be felt outside of the project area is one of the factors that determines the amount of detail required in any discussion. Less detail, for example, would be required where those effects are more indirect than effects felt within the project area, or where it [would] be difficult to predict them with any accuracy" (*Save the Plastic Bag Coalition v. City of Manhattan Beach* 2011).

For these reasons, both the California Natural Resources Agency (CNRA) and the courts have been somewhat skeptical of "life cycle" studies that purport to assess the global impact of particular activities or products. CNRA has twice declined to include a requirement for lifecycle analysis in the CEQA Guidelines. In 2009, CNRA amended Appendix F of the Guidelines (pertaining to analysis of energy conservation) to remove the term “lifecycle” because "[n]o existing regulatory definition of 'lifecycle' exists. In fact, comments received…indicate a wide variety of interpretations of that term" and "[m]oreover, even if a standard definition of the term 'lifecycle' existed, requiring such an analysis may not be consistent with CEQA. As a general matter, the term could refer to emissions beyond those that could be considered "indirect effects" of a project as that term is defined in section 15358 of the State CEQA Guidelines" (CNRA 2009). Similarly, in 2018, CNRA amended Section 15126.2 of the Guidelines (also pertaining to energy impacts) to caution that such impact analysis "is subject to the rule of reason, and must focus on energy demand caused by the project. This sentence is necessary to place reasonable limits on the analysis. Specifically, it signals that a full 'lifecycle' analysis that would account for energy used in building materials and consumer products will generally not be required." (CNRA 2018) Similarly, the California Supreme Court has specifically cautioned against "overreliance on generic studies of 'life cycle' impacts associated with a particular product." (*Save the Plastic Bag Coalition v. City of Manhattan Beach* 2011)

Nonetheless, these authorities have also noted that some evaluation of a product's lifecycle "may well be a useful guide for the decision maker when a project entails substantial production or consumption of the product." (Manhattan Beach) "[P]rojects may spur the manufacture of certain materials, and in such cases, consideration of the indirect effects of a project resulting from the manufacture of its components may be appropriate" (CNRA 2009). As such, this section will provide such analysis as is reasonably feasible regarding the GHG emissions generated by those aspects of the wood pellet "life cycle" occurring outside of California, in an effort to show good-faith analysis and comply with CEQA's information disclosure requirements. (For an informational evaluation of the project's criteria air pollutant lifecycle, see Section 3.7.5 within the GHG Emissions section.)

Specifically, this section will consider the following three aspects of the larger life cycle of the wood pellets produced by the proposed project:

- Transport to market outside of California's geographic jurisdiction;
- End-use combustion of wood pellets for energy generation; and
- Replacement of pre-existing fossil fuel energy sources with wood pellets.

As will appear, these three aspects are interconnected, and attempting to reach any specific impact conclusion regarding any or all of this "lifecycle" would be speculative. The location(s) to which the wood pellets will be exported are presently unknown, and therefore the distance they will be transported outside of California cannot be determined.[34] Similarly, whether these pellets will all be combusted at one energy generation facility, or at multiple facilities on different continents, and in what quantities, are unknown, as are the preexisting ambient air quality conditions at those locations (or the applicable regulatory standards or thresholds, if any, in those regions). Perhaps most importantly, the baseline conditions for this transport and combustion cannot be determined at this time, as it is unknown whether any or all of the wood pellets generated by this project will be used to replace other forms of power generation, with existing emissions that would be offset. Given the substantial national and international incentives that exist in many countries to transition energy generation from existing fossil fuel sources (i.e., coal) to other sources such as wood pellets (USITC 2022), it is reasonably likely that at least some portion of the pellets

34 The project proponent, GSNR, has entered into an exploratory "memorandum of understanding" with DRAX US BECCS Development, LLC to support the planning and review of the proposed project and evaluate potential investment, offtake, and/or other forms of engagement by DRAX in GSNR's Project. (Golden State Natural Resources, Ratification of Memorandum of Understanding between GSNR and Drax US BECCS Development, LLC Regarding Exploration of Sustainable Biomass Development Opportunities (February 20, 2024), available at https://www.rcrcnet.org/sites/default/files/useruploads/Meetings/Misc/2024/2.28.2024_GSNR_BOD_Packet.pdf). However, this memorandum is explicitly non-binding, and does not commit Drax (or any other party) to purchase or use any quantity of wood pellets or otherwise to "become involved in GSNR's Project." Therefore, while an energy generation facility operated by Drax (in the United Kingdom) is used below to model one potential emissions scenario example, for informational purposes, the prospect that any particular quantity of wood pellets produced by the project will actually be exported to this location remains entirely speculative.

produced by this project would be used to replace coal – but the amount(s) and location(s) in which this could occur are unknown at this time.

The analysis in this section is therefore intended to provide "a useful guide" to decision-makers and the public regarding these "lifecycle" aspects, subject to the above-mentioned "common sense" limitations.

Transport to Market Outside of California Geographic Jurisdiction

Transport of the wood pellets from their manufacturing point of origin to their consumer destination outside of the California jurisdictional boundary is anticipated to include ship travel across the ocean to Europe or Asia, potential ship travel in a river, and then on-land transport to the end-user. As an example, from the Port of Stockton to Immingham, United Kingdom (location of the Drax generating station), it would be 8,228 nautical miles via the Panama Canal through the Pacific and Atlantic Oceans.

To estimated potential emissions from ship travel outside of California, it was assumed that 29 Handymax vessels would make the trip per year, approximately 8,228 nautical miles one-way. Emissions were estimated assuming 24 hours per day and 46 days per trip (23 days one-way). It was assumed the ships would travel at 15 knots. Table 3.2-87 presents the estimated emissions from ship transport outside of California geographic jurisdiction.

Table 3.2-87. Estimated Annual Criteria Air Pollutant Emissions – Ship Transport Outside of California Geographic Jurisdiction

Action	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year					
Ship Transport	1,209.05	6,796.59	1,294.83	117.97	129.19	118.67

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

It is acknowledged that there may be additional emissions associated with on-land transport such as truck travel and potentially off-road equipment use between delivery of the wood pellet ship and the end user, such as a power plant. However, the type of emission sources as well as the activity data is too speculative to be evaluated herein.

End Use Combustion of Wood Pellets

As explained in Section 3.7, GHG Emissions, "fuel in use," or the combustion of wood pellets at the end user, and the associated emissions are not included in the conventional analyses of emissions attributed to biomass projects, utilizing the methodology developed by the European Union and commonly accepted by regulators and the industry. Nonetheless, potential criteria air pollutant emissions were estimated for informational purposes based on EPA's AP-42 Section 1.6 Wood Residue Combustion In Boilers. This method uses the wood pellet throughput in US tons per year, a wood pellet energy content of 17 GJ per U.S. ton, wood pellet density, wood pellet heating value, and AP-42 emission factors for the various pollutants identified (e.g., VOC, NO_x, CO, SO_2, PM_{10}, and $PM_{2.5}$). Table 3.2-88 presents the estimated criteria air pollutant emissions from combustion of wood pellets.

Table 3.2-88. Estimated Criteria Air Pollutant Emissions from Combustion of Wood Pellets

Fuel	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year					
Wood Pellets	141.78	1,834.76	6,254.85	208.50	2,251.75	1,334.37

Source: EPA AP-42 Section 1.6 Wood Residue Combustion In Boilers
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = value is less than 0.005.

As noted, whether these emissions will occur in one location or many, the existing ambient air quality, and any applicable regulatory standards in these locations, are all unknown, making it impossible to reach any impact conclusion. Further the foregoing calculations treat all the project's criteria air pollutant emissions as additive, without taking into account the likelihood that at least some portion of the pellets produced by this project would be used to replace coal, thus reducing the project's net lifecycle emissions. That baseline matter is discussed in the next section.

3.2.5.2 Replacement of Pre-Existing Fossil Fuel Energy Sources with Wood Pellets

Wood Pellets vs. Fuel Energy Sources - Lifecycle

As discussed above, biomass-derived wood pellets are often viewed as a renewable energy source with a substantially lower environmental impact when compared to coal, a non-renewable fossil fuel. Compared to fossil fuels, whose carbon contents are only replaced naturally after eons, many stakeholders treat wood pellets as a more sustainable source of fuel. The lifecycle of the wood pellets is typically considered to be renewable, and has been described by many policymakers and scholars as a carbon neutral process because the amount of carbon emitted during pellet combustion is almost entirely offset by the carbon sequestered through the trees' growth. However, this has been a topic of contention among environmental groups (Brack 2017).

As a source of fuel, biomass is often criticized for its comparatively low energy density. However, wood pellets, through the process of pulverization, drying, and compression, have a higher calorific value than other forms of biomass and are therefore a more favorable source of energy (Hamzah, et. al 2018).

Given the widespread view of biomass as environmentally superior to coal as a fuel source, substantial national and international incentives exist in many countries to transition energy generation from existing fossil fuel sources (i.e., coal) to biomass, including wood pellets (USITC 2022).

Efforts to compare the lifecycle criteria pollutant emissions of wood pellets to coal are inherently speculative, as the respective sources, destinations, and conditions under which each fuel source would be used are unknown. However, one study analyzing the efficacy of wood pellets as a fuel source found that wood pellet combustion generates less ash and fewer pollutants compared to coal. In fact, criteria air pollutants SO_2, NO_x, and PM, could be reduced by approximately 86%, 56%, and 33%, respectively (Wang, et.al 2016).

This study was used to estimate and compare the criteria air pollutant emissions associated with the entire lifecycle of wood pellets and coal, encompassing the different stages of fuel production, fuel transportation, and fuel combustion for heat generation (Wang et al. 2016). This research is based on a case study from China, and thus influenced by specific environmental and geographical factors such as resource availability and transportation logistics, it may not fully represent conditions for the project. Nevertheless, this analysis aims to underscore the differences in lifecycle emissions between wood pellets and coal on a broader scale. Table 3.2-89 shows the total estimated criteria air pollutant emissions from the lifecycle of GSNR's 100% throughput of wood pellets (1 million metric tons) and the equivalent throughput of coal, which includes emissions from production, transportation, and heat generation.

Table 3.2-89. Estimated Criteria Air Pollutant Emissions from the Lifecycle of Wood Pellets vs. Coal

Lifecycle Phase	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year				
Wood Pellets Lifecycle					
Production	841	248	972	299	135
Transportation	7	22	10	4	4
Heat Generation	107	146	4	86	40
Total	**955**	**416**	**985**	**389**	**179**
Coal Lifecycle					
Production	566	151	4,664	1,326	813
Transportation	682	242	171	78	17
Heat Generation	260	88	175	59	38
Total	**1,508**	**482**	**5,010**	**1,463**	**869**
Net Change (Transitioning Coal to Wood)	**-533**	**-66**	**-4,025**	**-1,074**	**-690**
Percent Change (Transitioning Coal to Wood)	*-37%*	*-14%*	*-80%*	*-73%*	*-79%*

Source: Wang et al. 2016
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
VOCs were not analyzed in this study.
This analysis assumes a wood pellet energy content of 17 GJ/ton and a coal energy content of 19 GJ/ton.

As shown in Table 3.2-89, using methodology from the study noted above, transitioning from coal to wood pellets would result in reductions in VOC, NO_x, CO, SO_2, PM_{10}, and $PM_{2.5}$ when considering their entire lifecycles.

As noted, this comparative analysis is speculative, and estimates of the net air quality benefit – or detriment – from conversion of coal energy to project-generated wood pellets are inherently uncertain. The study noted above, like all such studies, include many assumptions that may or may not represent actual conditions under which this conversion may occur in the future, (For example, the study noted above included assumptions regarding the relative transportation distances and combustion conditions of coal and pellets that cannot presently be either refuted or validated, since where and how any conversion will occur is unknowable at this time.) This supports, rather than detracts from, the ultimate conclusion reached here, i.e., that analysis of the lifecycle of wood pellets produced by the project is too speculative to reach a useful impact conclusion.

Wood Pellets vs. Fuel Energy Sources – Combustion Only

The preceding section endeavored to compare the relative criteria air pollutant impacts of wood pellets versus coal over the entire lifecycle of those fuel sources – which, as noted, involves a great many speculative variables. In order to maximize the value of this analysis as a "useful guide" for decision-makers, this section will further compare the respective criteria pollutant impacts of wood pellets and coal at one discrete point in the lifecycle – combustion by the end-user (i.e., "fuel in use").

To estimate and solely compare the criteria air pollutant emissions associated with end use burning of wood pellets vs. coal, two different methodologies were used. The first method used uncontrolled AP-42 emission factors as shown in Table 3.2-90, and the second method used controlled Washington State Department of Natural Resources emission factors (WSDNR 2010). The purpose of showing both methodologies is to present available data and analysis as there is no industry-standard approach, which subsequently highlights the difficulty and speculative nature of estimating and comparing emissions of wood pellet and coal combustion.

Based on the estimated annual throughput of wood pellets from GSNR and the estimated annual throughput of coal equivalent, potential criteria air pollutant emissions were calculated using the uncontrolled emission factors from the EPA's AP-42 Section 1.6 Wood Residue Combustion in Boilers for wood pellets (EPA 2022), and Section 1.2 for Anthracite Coal Combustion for coal (EPA 1996b). This method uses the wood pellet throughput in US tons per year, a wood pellet energy content of 17 GJ per U.S. ton, wood pellet density, wood pellet heating value, and AP-42 emission factors for the various pollutants identified (e.g., VOC, NO_x, CO, SO_2, PM_{10}, and $PM_{2.5}$). Table 3.2-90 compares the criteria air pollutant emissions for wood pellets and coal assuming 10% replacement, 50% replacement, and 100% replacement.

Table 3.2-90. Estimated Criteria Air Pollutant Emissions from Combustion of Wood Pellets vs. Coal – EPA AP-42

Fuel	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year					
10% Replacement						
Wood Pellets	14.18	183.48	625.49	20.85	225.17	133.44
Coal	14.79	443.83	29.59	1,153.95	394.51	394.51
Net Difference (Transitioning Coal to Wood)	-0.62	-260.35	595.90	-1,133.10	-169.34	-261.07
50% Replacement						
Wood Pellets	70.89	917.38	3,127.43	104.25	1,125.87	667.18
Coal	73.97	2,219.13	147.94	5,769.73	1,972.56	1,972.56
Net Difference (Transitioning Coal to Wood)	-3.08	-1,301.75	2,979.48	-5,665.48	-846.68	-1305.37
100% Replacement						
Wood Pellets	141.78	1,834.76	6,254.85	208.50	2,251.75	1,334.37
Coal	147.94	4,438.25	295.88	11,539.46[a]	3,945.11[b]	3,945.11[b]

Table 3.2-90. Estimated Criteria Air Pollutant Emissions from Combustion of Wood Pellets vs. Coal – EPA AP-42

Fuel	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year					
Net Difference (Transitioning Coal to Wood)	**-6.17**	**-2,603.50**	**5,958.97**	**-11,330.96**	**-1,693.37**	**-2,610.74**
Percent Change (Transitioning Coal to Wood)	*-4%*	*-142%*	*+95%*	*-5,435%*	*-75%*	*-195%*

Source: EPA 1996b ; EPA 2022
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
[a] A sulfur content of 0.6% was assumed which could vary.
[b] An ash content of 10% was assumed for this analysis which could vary. AP-42 has no differentiation between PM_{10} and $PM_{2.5}$ emission factors.
This analysis assumes a wood pellet energy content of 17 GJ/ton and a coal energy content of 19 GJ/ton.

As shown in Table 3.2-90, using AP-42 methodology, combustion of wood pellets (considered by itself) would result in higher emissions of CO compared to coal. For all other criteria air pollutants, including VOC, NO_x, SO_2, PM_{10}, and $PM_{2.5}$, combustion of wood pellets would result in a reduction of emissions compared to coal.

Based on the estimated annual throughput of wood pellets from GSNR and the estimated annual throughput of coal equivalent, potential criteria air pollutant emissions were also calculated using the controlled emission factors from the Washington State Department of Natural Resources (WSDNR 2010). Table 3.2-91 compares the criteria air pollutant emissions for wood pellets and coal assuming 10% replacement, 50% replacement, and 100% replacement.

Table 3.2-91. Estimated Criteria Air Pollutant Emissions from Combustion of Wood Pellets vs. Coal – Washington State Department of Natural Resources

Fuel	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year					
10% Replacement						
Wood Pellets	4.34	83.40	291.89	20.85	8.34 - 16.68	8.34 - 16.68
Coal	2.97	69.20 – 375.65	24.71	43.50 – 177.94	0.89 – 19.77	0.89 – 19.77
Net Difference (Transitioning Coal to Wood)	**1.37**	**14.2 – (-292.25)**	**267.18**	**-22.65 – (-157.09)**	**15.79 – (-11.43)**	**15.79 – (-11.43)**
50% Replacement						
Wood Pellets	21.68	416.99	1,459.47	104.25	41.70 - 83.40	41.70 - 83.40
Coal	14.83	345.99 – 1,878.24	123.57	217.48 – 889.69	4.45 – 98.85	4.45 – 98.85
Net Difference (Transitioning Coal to Wood)	**6.86**	**71.00 – (-1,461.25)**	**1,335.90**	**-113.23 – (-785.44)**	**78.95 – (-57.15)**	**78.95 – (-57.15)**

Table 3.2-91. Estimated Criteria Air Pollutant Emissions from Combustion of Wood Pellets vs. Coal – Washington State Department of Natural Resources

Fuel	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year					
100% Replacement						
Wood Pellets	43.37	833.98	2,918.93	208.50	83.40 - 166.80[a]	83.40 - 166.80[a]
Coal	29.66	691.98 - 3,756.49[a]	247.14	434.96 - 1,779.39[a]	8.90 - 197.71[a]	8.90 - 197.71[a]
Net Difference (Transitioning Coal to Wood)	**13.71**	**142.00 – (-2,922.51)**	**2,671.79**	**-226.47 – (1,570.89)**	**157.90 – (-114.31)**	**157.90 – (-114.31)**
Percent Change (Transitioning Coal to Wood)	*+32%*	*+17% - (-350%)*	*+92%*	*-109% - (-753%)*	*+95% - (-137%)*	*+95% - (-137%)*

Source: WSDNR 2010

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; ND = no data.

[a] Represents a range of emissions.

This analysis assumes a wood pellet energy content of 17 GJ/ton and a coal energy content of 19 GJ/ton.

As shown in Table 3.2-91, using Washington State Department of Natural Resources data, combustion of wood pellets (considered by itself) would result in higher emissions of CO and VOC and emissions reductions of SO_2, and could potentially result in higher emissions of NO_X, PM_{10}, and $PM_{2.5}$. However, due to high variability in emission factors, wood pellets could also potentially result in emissions reductions for NO_X, PM_{10}, and $PM_{2.5}$.

Conclusion

As noted, this comparative analysis is speculative, and estimates of the net air quality benefit – or detriment – from conversion of coal energy to project-generated wood pellets are inherently uncertain. The sources noted above include many assumptions that may or may not represent actual conditions under which this conversion may occur in the future, (For example, the AP-42 methodologies do not have controlled emission factors for all pollutants). This uncertainty regarding the real world baseline conditions under which wood pellets produced by the project will likely be used supports, rather than detracts from, the ultimate conclusion reached here, i.e., that analyses of wood pellet lifecycle emissions (whether considered alone, or by comparison to fossil fuels) are too speculative to reach a useful impact conclusion. This information is nonetheless provided here to outline the major issues and provide a useful guide for decisionmakers and the public when considering these larger air quality issues.

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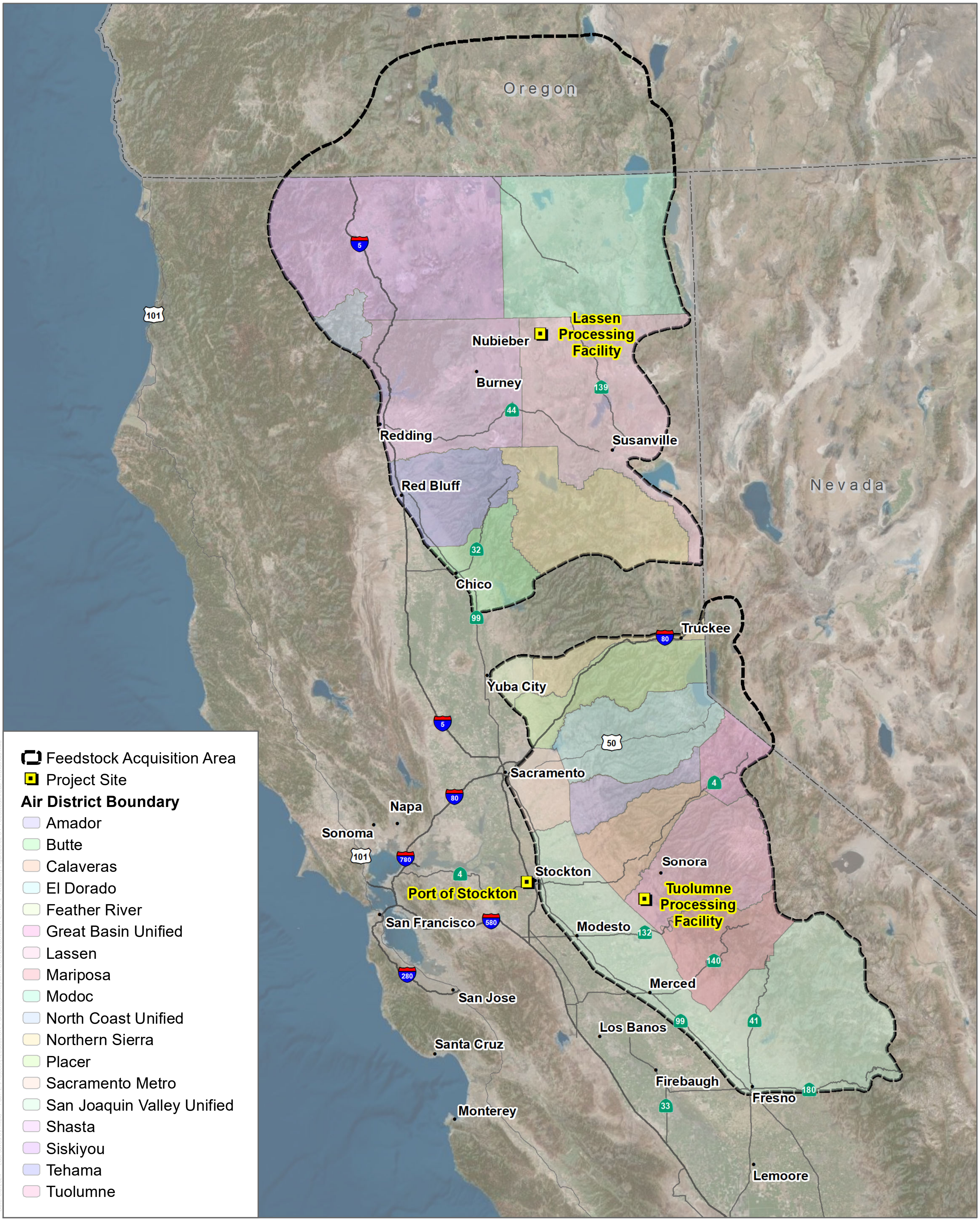

SOURCE: Bing Maps 2022, NHD 2022, CARI

DUDEK

0 25 50 Miles

FIGURE 3.2-1

Feedstock Areas - California Air Districts

Golden State Natural Resources Forest Resiliency Demonstration Project

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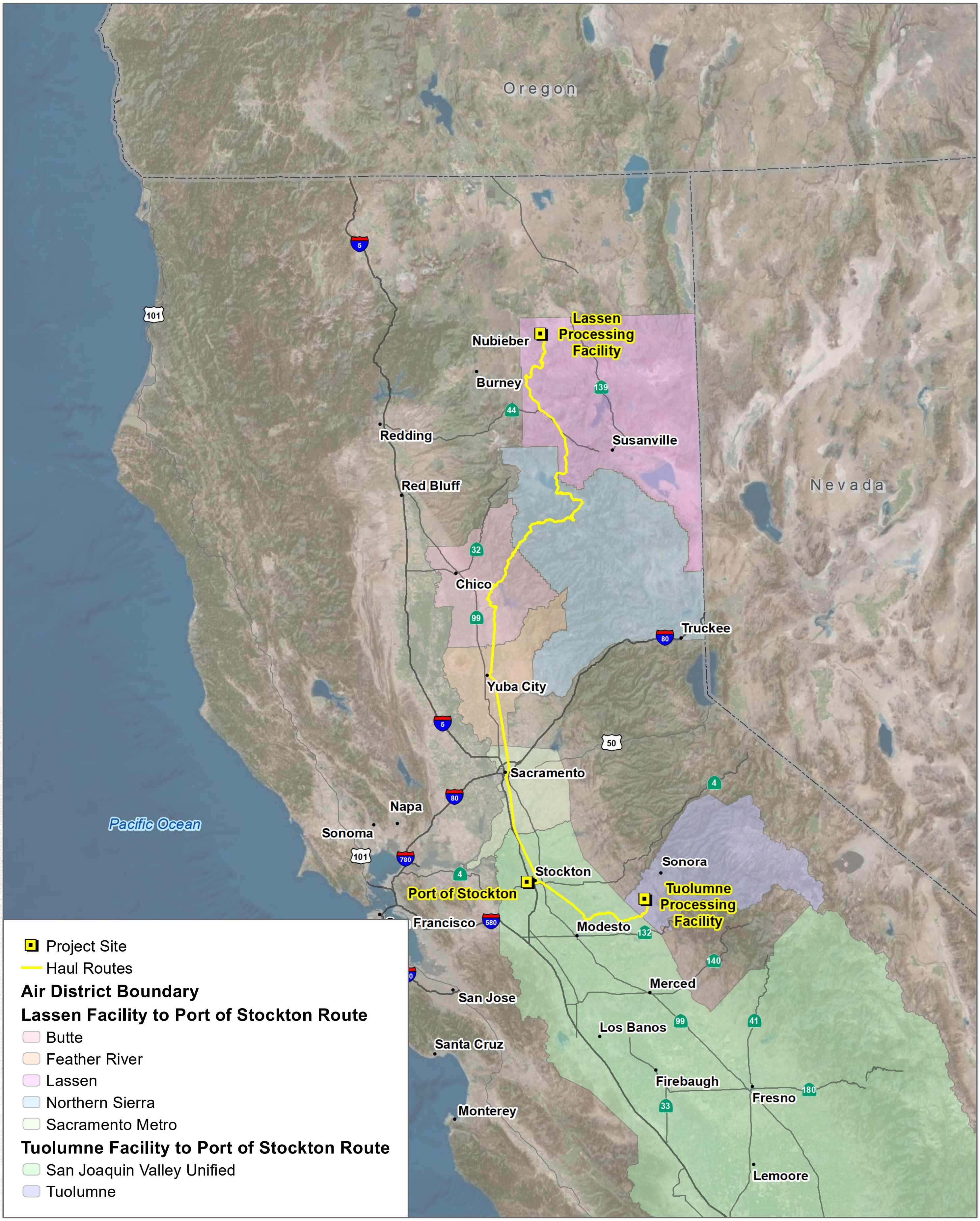

SOURCE: Bing Maps 2022, NHD 2022, CARI

DUDEK

FIGURE 3.2-2

Haul Routes - California Air Districts

Golden State Natural Resources Forest Resiliency Demonstration Project

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