4.2 AIR QUALITY

This section of the EIR presents an analysis of the potential air quality impacts associated with development and implementation of the proposed Master Plan, including five near-term development components (Project). This section presents the environmental setting, regulatory framework, impacts of the Project on the environment, and proposed measures to mitigate any significant or potentially significant impacts. Information in this section is based on information derived from the Transportation Analysis (Appendix H) and Air Quality and Greenhouse Gas Emissions Calculations (Appendix D).

No public and agency comments related to air quality were received during the public scoping periods in response to the original Notice of Preparation (NOP) or the Revision to Previously Issued NOP. For a complete list of public comments received during the public scoping periods, refer to Appendix B.

4.2.1 Environmental Setting

4.2.1.1 Affected Environment

The Project is located in the North Central Coast Air Basin (NCCAB), which consists of Monterey, Santa Cruz, and San Benito counties and encompasses an area of 5,159 square miles. The northwest sector of the basin is dominated by the Santa Cruz Mountains. The Diablo Range marks the northeastern boundary and, together with the southern extent of the Santa Cruz Mountains, forms the Santa Clara Valley, which extends into the northeastern tip of the NCCAB. Farther south, the Santa Clara Valley merges into the San Benito Valley, which extends northwest–southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley, which extends from Salinas at the northwest end to King City at the southeast end. The western side of the Salinas Valley is formed by the Sierra de Salinas, which also forms the eastern side of the smaller Carmel Valley. The coastal Santa Lucia Range defines the western side of the valley (County of Monterey 2008).

The semi-permanent high-pressure cell in the eastern Pacific is the basic controlling factor in the climate of the NCCAB. In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement. The generally northwest–southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. Surface heating in the interior portion of the Salinas and San Benito Valleys creates a weak low pressure that intensifies the onshore air flow during the afternoon and evening. In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay area or the Central Valley into the NCCAB. During the winter, the Pacific High migrates southward and has less influence on the NCCAB. Air frequently flows in a southeasterly direction out of the Salinas and San Benito Valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the NCCAB as a whole in winter and early spring (County of Monterey 2008).

4.2.1.2 Local Air Quality Conditions

North Central Coast Air Basin Attainment Designations

Pursuant to the 1990 federal Clean Air Act amendments, the U.S. Environmental Protection Agency (EPA) classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether the National Ambient Air Quality Standards (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 meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are redesignated 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, also requires the designation of areas as attainment or nonattainment but based on California Ambient Air Quality Standards (CAAQS) rather than the NAAQS. Table 4.2-1 identifies the current attainment status of the NCCAB, which includes the Project site, with respect to the NAAQS and CAAQS.

Table 4.2-1
North Central Coast Air Basin Attainment Classification

Pollutant	Averaging Time	Designation/Classification
National Standards		
O_3	8 hours	Unclassifiable/Attainment
NO_2	1 hour, annual arithmetic mean	Unclassifiable/Attainment
CO	1 hour; 8 hours	Unclassifiable/Attainment
SO_2	24 hours; annual arithmetic mean	Unclassifiable/Attainment
PM_{10}	24 hours	Unclassifiable/Attainment
$PM_{2.5}$	24 hours; annual arithmetic mean	Unclassifiable/Attainment

Table 4.2-1
North Central Coast Air Basin Attainment Classification

Pollutant	Averaging Time	Designation/Classification
Lead	Quarter; 3-month average	Unclassifiable/Attainment
California Standards		
O_3	1 hour; 8 hours	**Nonattainment**
NO_2	1 hour; annual arithmetic mean	Attainment
CO	1 hour; 8 hours	Attainment
SO_2	1 hour; 24 hours	Attainment
PM_{10}	24 hours; annual arithmetic mean	**Nonattainment**
$PM_{2.5}$	Annual arithmetic mean	Attainment
Lead	30-day average	Attainment
SO_4	24 hours	Attainment
H_2S	1 hour	Unclassified
Vinyl chloride	24 hours	No designation
Visibility-reducing particles	8 hours (10:00 a.m.–6:00 p.m.)	Unclassified

Sources: CARB 2020 (California); EPA 2020 (national).
Notes: O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SO_4 = sulfates; H_2S = hydrogen sulfide.

In summary, the NCCAB is designated as a nonattainment area for the state O_3 and PM_{10} standards. The NCCAB is designated as unclassified or attainment for all other state and federal standards (EPA 2020; CARB 2020). See Section 4.2.2, Regulatory Framework, for additional information about applicable regulations.

Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across California. 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. Table 4.2-2 presents the most recent background ambient air quality data from 2017 to 2020. The Salinas monitoring station, located at 855 E Laurel Drive, Salinas, California, is the nearest air quality monitoring station to the Project site, located approximately 10 miles northeast of the Project site. This station monitors O_3, NO_2, CO, and $PM_{2.5}$. The nearest station that monitors PM_{10} is located at 415 Pearl Street, King City, California, approximately 57 miles southeast of the Project site. The data collected at these stations is considered representative of the air quality experienced in the Project vicinity and is provided in Table 4.2-2. The number of days exceeding the ambient air quality standards are also shown in Table 4.2-2.

Table 4.2-2
Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year			
		2017	2018	2019	2020
Ozone (O_3) – Salinas Monitoring Station					
Maximum 1-hour concentration (ppm)	0.09 ppm (state)	0.082	0.089	0.072	0.073
Number of days exceeding California standard (days)		*0*	*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	0.070 ppm (state)	0.070	0.052	0.064	0.057
	0.070 ppm (federal)	0.070	0.052	0.063	0.057
Number of days exceeding California standard (days)		*0*	*0*	*0*	*0*
Number of days exceeding national standard (days)		*0*	*0*	*0*	*0*
Nitrogen Dioxide (NO_2) – Salinas Monitoring Station					
Maximum 1-hour concentration (ppm)	0.18 ppm (state)	0.034	0.047	0.030	0.032
	0.100 ppm (federal)	0.034	0.047	0.030	0.032
Number of days exceeding California standard (days)		*0*	*0*	*0*	*0*
Number of days exceeding national standard (days)		*0*	*0*	*0*	*0*
Annual concentration (ppm)	0.030 ppm (state)	0.004	0.005	0.004	0.004
	0.053 ppm (federal)	0.004	0.005	0.004	0.004
Carbon Monoxide (CO) – Salinas Monitoring Station					
Maximum 1-hour concentration (ppm)	20 ppm (state)	4.5	3.5	2.7	1.6
	35 ppm (federal)	4.5	3.5	2.7	1.6
Number of days exceeding California standard (days)		*0*	*0*	*0*	*0*
Number of days exceeding national standard (days)		*0*	*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	9.0 ppm (state)	0.8	0.9	0.8	1.2
	9 ppm (federal)	0.8	0.9	0.8	1.2
Number of days exceeding California standard (days)		*0*	*0*	*0*	*0*
Number of days exceeding national standard (days)		*0*	*0*	*0*	*0*
Fine Particulate Matter ($PM_{2.5}$) – Salinas Monitoring Station					
Maximum 24-hour concentration ($\mu g/m^3$)	35 $\mu g/m^3$ (federal)	42.2	64.0	53.0	87.0
Number of days exceeding national standard (days)[a]		*1.0 (1)*	*5.0 (5)*	*1.0 (1)*	*9.09*
Annual concentration ($\mu g/m^3$)	12 $\mu g/m^3$ (state)	5.5	8.5	5.6	6.8
	12.0 $\mu g/m^3$ (federal)	5.6	6.1	4.1	6.8
Coarse Particulate Matter (PM_{10}) – King City Monitoring Station					
Maximum 24-hour concentration ($\mu g/m^3$)	50 $\mu g/m^3$ (state)	ND	ND	ND	ND
	150 $\mu g/m^3$ (federal)	95.3	78.9	89.7	238.6
Number of days exceeding California standard (days)[a]		*ND*	*ND*	*ND*	*ND*
Number of days exceeding national standard (days)[a]		*0.0 (0)*	*0.0 (0)*	*0.0 (0)*	*2.12*
Annual concentration (state method) ($\mu g/m^3$)	20 $\mu g/m^3$ (state)	ND	ND	ND	ND

Sources: CARB 2021a; EPA 2021.
Notes: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; ND = insufficient data available to determine the value.

Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of 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 ozone, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
Salinas Monitoring Station is located at 855 E Laurel Drive, Salinas, 93901. King City Monitoring Station is located at 415 Pearl Street, King City, 93930.

[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.

4.2.1.3 Pollutants and Effects

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The 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 ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), 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 reactive organic gases (ROGs, also termed volatile organic compounds or VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere 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.,

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[1] The descriptions of the criteria air pollutants and associated health effects are based on the U.S. Environmental Protection Agency's (EPA's) Criteria Air Pollutants (EPA 2018) and the California Air Resources Board's (CARB's) Glossary of Air Pollutant Terms (CARB 2019a).

[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.

solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

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

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

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

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the ambient air quality standards (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 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 (CARB 2019c).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November 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 (CARB 2019d).

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

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

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in particulate matter (NRC 2005). Exposure to SO_2 for people with asthma is of particular concern, both because people with asthma 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}) 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; fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and residential fuel combustion; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides, NO_x, and ROG.

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

A number of adverse health effects have been associated with exposure to 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 (CARB 2017).

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 (CARB 2017).

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

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

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 $PM_{2.5}$ described above.

Reactive Organic Gases. 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 ROGs (also referred to as VOCs). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

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

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.

Examples of TACs include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles;

and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. 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 percent of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2019). DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including over 40 known carcinogenic organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2019). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) (Cal. Code Regs. tit.17, § 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars; and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70 percent 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 (CARB 2019). Those most vulnerable to non-cancer health effects are children, whose lungs are still developing, and the elderly, 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.

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, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. The term "sensitive receptors" is used to refer to facilities and structures where people who are sensitive to air pollution live or spend considerable amounts of time. 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).

In the immediate vicinity of the campus, the closest off-site sensitive receptors include residences located in Marina on Eighth Street approximately 0.25 miles to the north, the Dual Language Academy of the Monterey Peninsula approximately 0.63 miles to the south, the Major General William H. Gourley VA-Department of Defense Outpatient Clinic (VA Monterey Outpatient Clinic) approximately 0.66 miles to the west, and George C. Marshall Elementary School approximately 0.73 miles to the south. Furthermore, on-site sensitive receptors include the CSUMB Childcare Center, located on Third Avenue.

4.2.2 Regulatory Framework

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

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

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 VOCs, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

4.2.2.2 State

Criteria Air Pollutants

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

CARB has established 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 an air 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. All others are not to be equaled or exceeded.

California air districts 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. Table 4.2-3 presents the NAAQS and CAAQS.

Table 4.2-3
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
O_3	1 hour	0.09 ppm (180 $\mu g/m^3$)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 $\mu g/m^3$)	0.070 ppm (137 $\mu g/m^3$)[f]	
NO_2[g]	1 hour	0.18 ppm (339 $\mu g/m^3$)	0.100 ppm (188 $\mu g/m^3$)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	None
	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
SO_2[h]	1 hour	0.25 ppm (655 $\mu g/m^3$)	0.075 ppm (196 $\mu g/m^3$)	—
	3 hours	—	—	0.5 ppm (1,300 $\mu g/m^3$)
	24 hours	0.04 ppm (105 $\mu g/m^3$)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	20 $\mu g/m^3$	—	
$PM_{2.5}$[i]	24 hours	—	35 $\mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	12 $\mu g/m^3$	12.0 $\mu g/m^3$	15.0 $\mu g/m^3$
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 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent	—	—

Source: CARB 2016a.

Notes: ppm = parts per million by volume; $\mu g/m^3$ = micrograms per cubic meter; mg/m^3= milligrams per cubic meter.

[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 Cal. Code Regs., tit. 17, chapter 1, § 70200.

[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 a 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 one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

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

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

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

[f] On October 1, 2015, the primary and secondary NAAQS for O_3 were lowered from 0.075 ppm to 0.070 ppm.

[g] To attain the 1-hour national 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 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

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

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

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until one 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.

CARB's Mobile Source Strategy

On May 16, 2016, CARB released the 2016 Mobile Source Strategy that demonstrates how the state can simultaneously meet air quality standards, achieve GHG emission reduction targets, decrease health risk from transportation emissions, and reduce petroleum consumption over the next fifteen years. The actions contained in the 2016 Mobile Source Strategy will deliver broad environmental and public health benefits, as well as support much needed efforts to modernize and upgrade transportation infrastructure, enhance system-wide efficiency and mobility options, and promote clean economic growth in the mobile sector.

The estimated benefits of the strategy in reducing emissions from mobile sources includes an 80 percent reduction of smog-forming emissions and a 45 percent reduction in DPM. Statewide, and if fully implemented, the 2016 Mobile Source Strategy would also result in a 45 percent reduction in GHG emissions, and a 50 percent reduction in the consumption of petroleum-based fuels (CARB 2016b).

In September 2019, Governor Newsom signed Senate Bill (SB) 44 which acknowledges the ongoing need to evaluate opportunities for mobile source emissions reductions and requires CARB to update the 2016 Strategy by 2021 and every five years thereafter. Specifically, SB 44 requires CARB to update the 2016 Strategy to include a comprehensive strategy for the deployment of medium- and heavy-duty vehicles for the purpose of meeting air quality standards and reducing GHG emissions. It also directs CARB to set reasonable and achievable goals for reducing emissions by 2030 and 2050 from medium- and heavy-duty vehicles that are consistent with the State's overall goals and maximizes the reduction of criteria air pollutants.

In response, CARB developed the 2020 Mobile Source Strategy that, similar to the 2016 Mobile Source Strategy, is a framework to identify the technology trajectories and programmatic concepts to meet our criteria pollutant, GHG, and TAC emission reduction goals from mobile sources. The 2020 Mobile Source Strategy was heard by CARB in October 2021 and will be incorporated in other planning efforts such as the State Implementation Plan and 2022 Climate Change Scoping Plan Update.

The estimated benefits of the 2020 Mobile Source Strategy in reducing emissions from mobile sources includes an 82 percent reduction of smog-forming emissions by 2037 and a 66 percent reduction in DPM by 2031. The 2020 Mobile Source Strategy, if fully implemented, would also result in a 76 percent reduction in GHG emissions by 2045, and 85 percent and 77 percent of passenger cars and heavy-duty trucks would be zero-emission vehicles (ZEV) or plug-in hybrid electric vehicles (PHEV) in 2045 (CARB 2021c).

Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs.

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-percent 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. There are several airborne toxic control measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (Cal. Code Regs., tit. 13, § 2449 *et seq.*) and In-Use On-Road Diesel-Fueled Vehicles (Cal. Code Regs., tit. 13, § 2025). On June 25, 2020, CARB adopted the final rule for new standards that require the sale of zero-emission heavy-duty trucks (HDTs), starting with the 2024 model year. The Advanced Clean Trucks (ACT) rulemaking finalizes standards that were initially proposed on October 22, 2019 and strengthened in a revised proposal on April 28, 2020 (CARB 2021b). The ACT would require manufacturers to sell increasing percentages of zero-emission trucks, is expected to reduce the lifecycle emission of GHGs, eliminate tailpipe emissions of air pollutants, and foster a market for zero-emission HDTs.

Airborne Toxic Control Measures

In July 2004, CARB adopted an airborne toxic control measure (ATCM) to limit motor vehicle idling within California. The control measure was adopted as part of a program to reduce public exposure to DPM. The measure applies to all diesel-fueled vehicles over 10,000 pounds, regardless of the state in which they are registered. Effective 2008, all heavy-duty trucks are prohibited from idling to maintain comfortable sleeper berth conditions. Idling is not permitted in school areas or 100 feet from a restricted area for more than 5 minutes unless the vehicle is engaged in working activities.

California Health and Safety Code § 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 (Cal. Health and Safety Code § 41700). This section also applies to sources of objectionable odors.

California State University

In May 2014, the CSU Board of Trustees adopted the first CSU system-wide Sustainability Policy. The policy aims to reduce the environmental impact of construction and operation of buildings and to integrate sustainability across the curriculum. The CSU Sustainability Policy established the following goals which may be applicable to air quality: Promote use of alternative fuels and transportation programs, procure 33 percent of energy supply from renewable sources by 2020, and increase on-site energy generation from 44 to 80 megawatts by 2020. This policy is in the process of being updated.

4.2.2.3 Regional

Monterey Bay Air Resources District

The Monterey Bay Air Resources District (MBARD) is the regional agency responsible for the regulation and enforcement of national, state, and local air pollution control regulations in the NCCAB, where the Project is located. The MBARD operates monitoring stations in the NCCAB, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The MBARD's Air Quality Management Plans (AQMPs) include control measures and strategies to be implemented to attain CAAQS and NAAQS in the NCCAB. The MBARD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

Air Quality Management Plan (AQMP)

The 1991 AQMP for the Monterey Bay Area was the first plan prepared in response to the California Clean Air Act of 1988, which established specific planning requirements to meet the O_3 standard. The California Clean Air Act requires that the AQMP be updated every 3 years. The most recent update is the *2012–2015 Air Quality Management Plan* (2012–2015 AQMP), which was adopted in March 2017, and is an update to the elements included in the 2012 AQMP. The primary elements updated from the 2012 AQMP are the air quality trends analysis, emission inventory, and mobile source programs.

The NCCAB is a nonattainment area for the CAAQS for both O_3 and PM_{10}. The AQMP addresses only attainment of the O_3 CAAQS. Attainment of the PM_{10} CAAQS is addressed in the MBARD's *2005 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region* (Particulate Matter Plan), which was adopted in December 2005 and is summarized further below. Maintenance of the 8-hour NAAQS for O_3 is addressed in MBARD's *2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region* (Federal Maintenance Plan), which was adopted in March 2007 and is also summarized below. The 2007 Federal Maintenance Plan is an update to the 1994 Federal Maintenance Plan that was prepared for the 1-hour NAAQS for ozone. However, that standard has been revoked and superseded by the current 8-hour ozone standard. MBARD's Federal Maintenance Plan documents maintenance of the 1997 federal ozone standard. Notably, because the NCCAB is unclassifiable/attainment for all criteria air pollutants in regard to the NAAQS, additional planning documentation has not been required since approval of the Federal Maintenance Plan. Furthermore, the Particulate Matter Plan includes review of the basin's air monitoring emissions data with characterization of sources that likely to cause or contribute to monitored violations of the standard in the NCAAB. The major cause of exceedances in the NCCAB is naturally occurring sea salt, without which, three quarters of all exceedances in the NCCAB would not have occurred. Therefore, there are no planning requirements associated with sea salt, and the remaining exceedances are relatively infrequent and not substantially above the standard.

A review of the air monitoring data for 2013 through 2015 indicates that there were fewer exceedance days compared to previous periods (i.e., ambient air quality did not exceed the AAQS as frequently as in times past) (MBARD 2017). The long-term trend shows that progress has been made toward achieving O_3 standards. The number of exceedance days has continued to decline during the past 10 years despite population increases. The MBARD's 2012–2015 AQMP identifies a continued trend of declining O_3 emissions in the NCCAB primarily related to lower vehicle miles traveled (VMT). Therefore, the MBARD determined progress was continuing to be made toward attaining the 8-hour O_3 standard during the three-year period reviewed (MBARD 2017).

Federal Maintenance Plan

The Federal Maintenance Plan (May 2007) presents the strategy for maintaining the NAAQS for O_3 in the NCCAB. It is an update to an earlier maintenance plan (1994) that was prepared for maintaining the 1-hour NAAQS for O_3, a national standard that has since been revoked and superseded by the current 8-hour O_3 standard. Effective June 15, 2004, the EPA designated the NCCAB as an attainment area for the 8-hour NAAQS for O_3. The plan includes an emission inventory for the years 1990 to 2030 for ROG and NO_x, the two primary O_3 precursor gases. A contingency plan is included to ensure that any future violation of the standard is promptly corrected (MBARD 2007).

Particulate Matter Plan

The purpose of the Particulate Matter Plan (December 2005) is to fulfill the requirements of Senate Bill 655, which was approved by the California Legislature in 2003 with the objective of reducing public exposure to particulate matter. The legislation requires CARB, in conjunction with local air pollution control districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air pollution control districts to reduce ambient levels of particulate matter in their air basins (MBARD 2005). The Particulate Matter Plan's activities include control measures for fugitive dust, public education, administrative functions, and continued enhancements to the MBARD's smoke management and emission-reduction incentive programs.

Rules and Regulations

The MBARD establishes and administers a program of rules and regulations to attain and maintain state and national air quality standards and regulations related to TACs. Rules and regulations that may apply to the Project during construction and/or operations include the following:

- Regulation IV (Prohibitions), Rule 400 (Visible Emissions). This rule provides limits for visible emissions for sources within the MBARD jurisdiction. *(For purposes of the Project, this rule is anticipated to primarily be of relevance during the construction phase for purposes of controlling the amount of fugitive dust generated by construction equipment.)*
- Regulation IV (Prohibitions), Rule 402 (Nuisances). This rule prohibits sources creating public nuisances while operating within the MBARD jurisdiction. *(For purposes of the Project, this rule is anticipated to primarily be of relevance for all sources of criteria air pollutant emissions during both construction and operation of the Project.)*
- Regulation IV (Prohibitions), Rule 403 (Particulate Matter). This rule provides particulate matter emissions limits for sources operating within the MBARD jurisdiction. *(For purposes of the Project, this rule is anticipated to primarily be of relevance during the construction phase for purposes of controlling the amount of fugitive dust generated during grading activities.)*
- Regulation IV (Prohibitions), Rule 424 (National Emission Standards for Hazardous Air Pollutions). This rule provides clarity on the MBARD's enforcement authority for the National Emission Standards for Hazardous Air Pollution including asbestos from demolition. *(For purposes of the Project, this rule is anticipated to primarily be of relevance during operations for purposes of controlling the amount of criteria air pollutants and TACs from new stationary sources such as emergency generators.)*
- Regulation IV (Prohibitions), Rule 425 (Use of Cutback Asphalt). This rule establishes VOC emissions limits associated with the use of cutback and emulsified asphalts. *(For purposes of the Project, this rule is anticipated to primarily be of relevance during the construction phase for purposes of limiting the amount of VOCs during paving activities.)*
- Regulation IV (Prohibitions), Rule 426 (Architectural Coatings). This rule establishes VOC emissions limits associated with the use of architectural coatings. *(For purposes of the Project, this rule is anticipated to primarily be of relevance during the construction phase for purposes of limiting the amount of VOCs from architectural coatings.)*
- Regulation II (Permits), Rule 207 (Review of New or Modified Sources). The MBARD regulates criteria air pollutant emissions from new and modified stationary sources through this rule. *(For purposes of the Project, this rule is anticipated to primarily be of relevance during operations for purposes of controlling the amount of criteria air pollutants from new stationary sources such as emergency generators.)*
- Regulation X (Toxic Air Contaminants), Rule 1000 (Permit Guidelines and Requirements for Sources Emitting Toxic Air Contaminants). The MBARD also regulates TACs from new or modified sources under Rule 1000, a Board-approved protocol that applies to any source that requires a permit to construct or operate pursuant to MBARD regulations and has the potential to emit carcinogenic or noncarcinogenic TACs. The MBARD's Rule 1000 also requires sources of carcinogenic TACs to install best control technology and

reduce cancer risk to less than one incident per 100,000 population. Sources of noncarcinogenic TACs must apply reasonable control technology. *(For purposes of the Project, this rule is anticipated to primarily be of relevance during operations for purposes of controlling the amount of TACs from new stationary sources such as emergency generators.)*

4.2.3 Impacts and Mitigation Measures

This section presents the evaluation of potential environmental impacts associated with the Project related to air quality. The section identifies the thresholds of significance used in evaluating the impacts, the methods used in conducting the analysis, and the evaluation of Project impacts and the Project's contribution to significant cumulative impacts. In the event significant impacts within the meaning of CEQA are identified, appropriate mitigation measures, where feasible, are identified.

4.2.3.1 Thresholds of Significance

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

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

Appendix G of the CEQA Guidelines also provides that "[w]here available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make" the determinations described above. Therefore, the following discussion provides information on the MBARD's CEQA guidance.

The MBARD has adopted two sets of CEQA Guidelines, which contain different thresholds of significance depending on the CEQA lead agency. The *Guidelines for Implementing the California Environmental Quality Act* (2016 Guidelines) (MBARD 2016) were written for use by the MBARD in its capacity as lead or responsible agency, whereas the *CEQA Air Quality Guidelines* (2008 Guidelines) (MBARD 2008) were written for all other lead agencies. Notably, the 2016 Guidelines include air pollutant thresholds for construction that were not included in the 2008 Guidelines. Since the MBARD is a responsible agency for this Project, given that it would issue air pollution permits for generators that may be required for the Project, the thresholds included in the 2016 Guidelines (see page 4) were applied to the Project (MBARD 2016). The 2008 Guidelines also only included thresholds for PM_{10}, indicating that ROG and NO_x emissions would not have a significant impact on attainment and maintenance of ozone AAQS since these criteria air pollutants are accommodated in the emission inventories of state- and federally-required air plans. Therefore, using the 2016 Guidelines would allow for a more complete evaluation of air quality impacts from ROG, NO_x, PM_{10}, $PM_{2.5}$, and CO emissions.

Specifically, under the MBARD's 2016 Guidelines, a project would result in a significant impact to air quality during construction and/or operations if it results in the generation of emissions of or in excess of any of the following:

- 137 pounds per day of ROG or NO_x
- 82 pounds per day of PM_{10}
- 55 pounds per day of $PM_{2.5}$
- 550 pounds per day of CO

MBARD also regulates TACs from new or modified sources under Rule 1000 and a Board-approved protocol. They apply to any source that requires a permit to construct or operate pursuant to District Regulation II (Permits) and has the potential to emit carcinogenic or noncarcinogenic TACs. TACs are listed in Title I or are established by the Office of Environmental Health Hazard Assessment (OEHHA), CAPCOA Risk Assessment Guidelines, U.S. Environmental Protection Agency, or Rule 1000. Rule 1000 also requires sources of carcinogenic TACs to install best control technology and reduce cancer risk to less than one incident per 100,000 population. Relatedly, MBARD's 2016 Guidelines indicate that the thresholds used to evaluate human health impacts are in accordance with Air District Rules 1000 and 1003. Accordingly, a project would have a significant impact if: the hazard index is greater than 1 for acute or chronic impacts and/or if the cancer risk is greater than 10 in 1 million, which is equivalent to the 1 in 100,000 cancer risk cited in Rule 1000.

4.2.3.2 Analytical Method

Program- and Project-Level Review

The air quality impact analysis in this section includes a program-level analysis under CEQA of the proposed Master Plan and project design features (PDFs), as described in Chapter 3, Project Description. The analysis also includes a project-level analysis under CEQA of the 5 near-term development components that would be implemented under the proposed Master Plan, as described in Chapter 3, Project Description. Both construction and operation of the Project are considered in the impact analysis, where relevant. In the event significant adverse environmental impacts would occur with the implementation of the Project even with incorporation of applicable regulations and proposed PDFs, mitigation measures would be identified to reduce impacts to less than significant, where feasible.

Project Design Features

Project elements that would affect the transportation system, and therefore mobile sources of air emissions, include the proposed increase in student enrollment and associated increase in faculty and staff, the added on-campus housing for students, faculty, and staff, and a Main Campus street and parking system that facilitates and prioritizes walking, bicycling, and transit use over vehicle travel. The related PDFs are summarized below. See Chapter 3, Project Description for the details each PDF.

There are a number of PDFs that are incorporated quantitatively into the trip generation rates contained in the Transportation Analysis (Appendix H), including PDF-MO-1, PDF-MO-2, PDF-MO-6(c), and PDF-MO-8, and therefore are quantitatively incorporated into the air quality analysis:

- *PDF-MO-1 and PDF-MO-2* provide that CSUMB will accommodate at least 60 percent of enrolled students and 65 percent of faculty and staff in on-campus housing. CSUMB will implement these PDFs to ensure that these campus housing goals are met, which will minimize vehicle commute travel to and from the campus. Appendix C, Student Housing and Parking Management Guidelines, and the CSUMB Housing Guidelines (CSUMB 2022) provide additional information about meeting the identified housing goals.
- *PDF-MO-6(c)* provides that CSUMB will implement strategies and measures to reduce parking demand, including that parking will be consolidated and relocated to select areas on the periphery of the campus core. While this PDF includes other measures (e.g., maintaining existing parking supply, prohibiting residential Freshmen and Sophomores from purchasing a parking permit, a "park once" policy), such measures are not assumed in the quantitative analysis.
- *PDF-MO-8* establishes restrictions to general vehicle travel through the campus core and locates vehicle circulation and parking on the campus periphery (see Chapter 3, Project Description, Figure 3-9). Specifically, vehicle access will be limited to CSUMB students, faculty, and staff vehicles on General Jim Moore Boulevard between Eighth Street and Fifth Street. Vehicle travel through the campus core will be restricted to shuttles, transit vehicles, service vehicles, and emergency vehicles at: Inter-Garrison Road between General Jim Moore Boulevard and Sixth Avenue, Divarty Street between General Jim Moore Boulevard and Seventh Avenue, Fourth Avenue between Divarty Street and Inter-Garrison Road, Fifth Avenue between Divarty Street and Inter-Garrison, A Street between Divarty Street and Seventh Avenue, Sixth Avenue between B Street and north of Divarty Street, and Butler Street between Sixth Avenue and Seventh Avenue. Additionally, Seventh Avenue between Colonel Durham Street and Butler Street will be converted to one-way for vehicles traveling north from Colonel Durham Street to Inter-Garrison Road.

As indicated in Section 4.13, Transportation, to provide for a conservative analysis, other mobility PDFs are considered qualitatively, including PDF-MO-3 through PDF-MO-7, and PDF-MO-9 through PDF-MO-19. While these PDFs would serve to reduce vehicle travel and promote transit, bicycle and pedestrian mobility, their ability to reduce vehicle travel is not quantified in the Transportation Analysis (Appendix H) and therefore the air quality analysis conservatively does not include these PDFs in the operational emissions estimates identified below. These PDFs are described in detail in Chapter 3, Project Description.

Technical Methods

The Project identifies anticipated development by land use type and square footage. While specific details about construction and operation of the Project are currently not available, Project-generated emissions were estimated based on a reasonably conservative assessment to disclose the magnitude of potential criteria air pollutant emissions generated during construction and operation of the Project.

Construction Emissions

Emissions from the construction phase of the Project, including the near-term development components, were estimated using California Emissions Estimator Model (CalEEMod) Version 2020.4.0. CalEEMod utilizes widely accepted methodologies for estimating emissions combined with default data that can be used when site-specific information is not available. Sources of these methodologies and default data include but are not limited to the EPA AP-42 emission factors, CARB vehicle emission models, and studies commissioned by California agencies such as the California Energy Commission and CalRecycle. In addition, some local air districts (e.g., MBARD) provide customized values for their default data and existing regulation methodologies for use in evaluating projects located in their jurisdictions. Construction modeling parameters, including phasing, equipment mix, and vehicle trips, were based on CalEEMod default values and specific construction equipment mix information for typical campus projects as provided by CSUMB.

For purposes of estimating construction emissions for the Project, including the near-term development components, it was estimated that up to approximately 300,000 gross square feet (GSF) of building space would be under construction concurrently. This estimate was developed based on review of the proposed Master Plan, and the following near-term development components, along with other development: 1) Student Housing Phase III (600 student housing beds); 2) Academic IV (95,000 GSF of classroom/instructional space); 3) Student Recreation Center (70,000 GSF of recreation space); 4) Student Housing Phase IIB (400 student housing beds); and 5) Academic V (76,700 GSF of classroom/instructional space) (CSU 2019). Therefore, based on consideration of the maximum amount of construction that could be underway concurrently, the construction analysis is based on a maximum scenario of 300,000 GSF of building space under construction concurrently.

CalEEMod default parameters were used to estimate construction emissions. Notably, because California's construction-related emission sources are regulated, Project construction emissions are reasonably expected to continue to decline as Tier 4[3] construction equipment becomes more widely available. Thus, by utilizing the earliest possible start date, the Project's estimated emissions likely overstate actual emission levels. Therefore, the analysis and modeling included herein provides an accurate and conservative assessment of the Project's construction-related air pollutant emissions.

While construction specifics and phasing for buildout of the Project, including the near-term development components, are not currently available, the emissions generated from concurrent construction associated with a maximum scenario of 300,000 GSF of buildings were determined to provide a conservative basis for the evaluation of construction activities potentially occurring simultaneously on the campus under the Project over 15 years (2035). The analysis contained herein is based on the following modeling parameters for the representative construction scenario (duration of phases is approximate):

- Demolition: 20 days
- Site Preparation: 10 days
- Grading: 20 days
- Building Construction: 230 days
- Paving: 20 days
- Application of Architectural Coatings: 20 days

In order to capture haul trips from demolition, it was assumed that the construction scenario would involve the demolition of Building 13 and Parking Lots 13, 19, and 300, based on information provided by CSUMB and considering the types of features present on some of the near-term development component sites. Grading quantities are currently not identified, and grading is anticipated to be minimal because the site is already developed; therefore, construction sites would be balanced and not require substantial import or export of soil. To capture emissions associated with asphalt paving and other impervious surfaces, it was estimated that 1.8 acres would be developed at each construction site, which was estimated by using Google Earth.

[3] Tier 4 refers to the emission standards established by the EPA and CARB which are applicable to new engines found in off-road equipment including construction, mining and agricultural equipment, marine vessels and workboats, locomotives and stationary engines found in industrial and power generation applications. As of January 1, 2014, these emissions standards apply to new engines that power equipment commonly found in most construction and agricultural applications. Tier 4 compliant engines significantly reduce PM and NO_x emissions. Compared to previous emissions standards, Tier 4 compliant engines reduce emissions by over 95 percent for most construction equipment.

Construction worker and vendor truck trips by construction phase were based on CalEEMod default values. CalEEMod default trip length values were used for the distances for all construction-related trips.

The construction equipment mix and vehicle trips used for estimating the Project-generated construction emissions are shown in Table 4.2-4. For the analysis, it was estimated that heavy construction equipment would be operating at the site 5 days per week (22 days per month) during Project construction. Specific CalEEMod parameters for each model scenario, including quantity of equipment, are provided in Appendix D.

As indicated by the analysis for Impact AIR-2, the construction emissions associated with the Project fall well under the MBARD significance thresholds, based on the evaluated construction scenario of 300,000 GSF of building space under construction concurrently. Given that each of the near-term development components would be well under this square footage, separate construction emissions estimates were not conducted for each of the near-term development components, as such estimates were not required to determine the significance of the near-term development components' impacts.

Table 4.2-4
Construction-Related Modeling Inputs

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Total Haul Truck Trips	Equipment Type	Quantity	Usage Hours per Day
Demolition	15	0	200	Concrete/industrial saws	1	8
				Excavators	3	8
				Rubber Tired Dozers	2	8
Site preparation	18	0	0	Rubber Tired Dozers	3	8
				Tractors/loaders/backhoes	4	8
Grading	15	0	0	Graders	1	8
				Rubber tired dozers	1	8
				Tractors/loaders/backhoes	3	8
				Excavator	1	8
Building construction	159	62	0	Cranes	1	7
				Forklifts	3	8
				Generator sets	1	8
				Tractors/loaders/backhoes	3	7
				Welders	1	8
Paving	15	0	0	Pavers	2	8
				Paving equipment	2	8
				Rollers	2	8
				Tractors/loaders/backhoes	1	8
Architectural coating	32	0	0	Air compressors	1	6

Notes: See Appendix D for details.

Operational Emissions

Emissions from the operational phase of the Project, including all proposed development described in Chapter 3, Project Description, which includes the near-term development components, and all existing campus development that will remain with the Project, were estimated using CalEEMod Version 2020.4.0, based on an operational year 2035, the estimated planning horizon for the Project. Operational air quality emissions were estimated for area sources (consumer product use, architectural coatings, and landscape maintenance equipment), energy sources (natural gas), and mobile sources, as further described below. Additionally, PDF-MO-1, PDF-MO-2, PDF-MO-6(c), and PDF-MO-8 were accounted for in the Project emissions, as they were incorporated into the trip generation rates, as described in Section 4.2.3.2, Analytical Methods.

Emissions associated with the existing campus were also estimated using CalEEMod to present the net change in criteria air pollutant emissions. Operational year 2017 was used for existing conditions, which is based on the most recent available mobile, energy use, and water consumption data available. The total existing land uses within the CSUMB campus that are currently occupied and, therefore, evaluated comprise approximately 3,190,556 square feet (see Chapter 3, Project Description, Table 3-3).

To calculate the net increase in operational emissions with the Project, the emissions from the existing campus were subtracted from the emissions from the operational phase of the Project, as the operational phase estimate includes all proposed development and all existing campus development that will remain with the Project. Existing and Project land use modeling parameters in CalEEMod were based on the Transportation Analysis (Appendix H).

As indicated in the analysis for Impact AIR-2, the net increase in operational emissions associated with the Project, which includes the near-term development components, falls well under the MBARD significance thresholds. Therefore, separate operational emissions estimates were not conducted for each of the near-term development components, as such estimates were not required to determine the significance of the near-term development components' impacts.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating, water heating, and stoves are calculated in the building energy use module of CalEEMod, as described in the following text. The existing and Project conditions would not include woodstoves or fireplaces (wood or natural gas). As such, area source emissions associated with hearths were not included.

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 2021). Consumer product VOC (i.e., ROG) emissions are estimated in CalEEMod based on the floor area of nonresidential (main campus facilities) and residential (student and faculty housing) buildings and on the default factor of pounds of VOC per building square foot per day. For the asphalt surface land use considered in the Project scenario, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on a 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 in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of residential and nonresidential surface coatings based on the VOC emission factor, the building square footage, the estimated fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings, and MBARD Rule 426, which restricts the VOC content for interior and exterior coatings. The model default reapplication rate of 10 percent of area per year is used. Consistent with CalEEMod defaults, the nonresidential surface area for painting equals 2.0 times the floor square footage, with 75 percent coverage for interior coating and 25 percent coverage for exterior surface coating and the residential surface area for painting equals 2.7 times the floor square footage, with 75 percent assumed for interior coating and 25 percent assumed for exterior surface coating. For the other asphalt surfaces considered in the Project scenario, the architectural coating area is 6 percent of the total square footage, consistent with the supporting CalEEMod studies provided as an appendix to the CalEEMod User's Guide (CAPCOA 2021).

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

Energy Sources

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

Mobile Sources

Mobile sources for the Project would primarily be motor vehicles (automobiles and light-duty trucks) traveling to and from the campus. Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. The default vehicle mix provided in CalEEMod 2020.4.0, which is based on CARB's Mobile Source Emissions Inventory model, EMFAC, version 2017, was applied for both existing and Project conditions.

Trip generation rates for existing and Project conditions were based on the Transportation Analysis prepared for the Project (see Appendix H). Default vehicle trip generation rates included in CalEEMod for each of the analyzed land uses were adjusted to match the existing campus and the Project's trip generation estimates from the Transportation Analysis. In addition, Saturday and Sunday trip rates for both the existing campus and the Project were adjusted in proportion to the CalEEMod weekday trip rates because weekend trip-generation rates were not provided in the Transportation Analysis. CalEEMod default trip distances were adjusted to match the annual VMT for the existing campus (178,500 miles) and the Project (295,500 miles). Other CalEEMod default data, including temperature, trip characteristics, variable start information, and emissions factors were conservatively used for the model inputs. Project-related traffic includes a mix of vehicles in accordance with the model defaults. Emission factors representing the vehicle mix and emissions for 2035 (the first full year of operation) were used to estimate emissions associated with the Project.

Trip rate inputs for existing and Project conditions are shown in Table 4.2-5.

Table 4.2-5
Existing and Project Trip Rates

Land Use	CalEEMod Land Use Surrogate	Revised Trip Rate[c]		
		Weekday[a]	Saturday[b]	Sunday[b]
Existing				
Non-Residential Campus Facilities	University/College (4Yr)	1.51	1.15	0.00
Student and Faculty, Staff & Community Partners Housing	Apartments Mid Rise	1.69	1.62	1.53
Project				
Non-Residential Campus Facilities	University/College (4Yr)	1.89	1.43	0.00
Student and Faculty, Staff & Community Partners Housing	Apartments Mid Rise	0.71	0.69	0.65

Source: Appendix H.
Notes:
a Weekday trip rates are calculated from the existing campus and the Project's trip generation from the Transportation Analysis (Appendix H).
b Saturday and Sunday trip rates were adjusted in proportion to the Transportation Analysis weekday trip rates.
c Non-residential campus facilities trip rate is per student and faculty and student housing trip rates are based on number of units and/or beds.

Stationary Sources and Other Sources of Emissions

Based on the type of land uses that would be developed under the Project, there are additional emission sources that are either not captured in CalEEMod or cannot be accurately accounted for in CalEEMod due to the absence of necessary data. Potential additional sources of criteria air pollutant and TAC emissions include: emergency generators and various VOC sources such as from art and science laboratories/rooms. Because specifics are not available to accurately estimate emissions from these anticipated sources under the Project and existing conditions, associated emissions are not included in the estimated emissions presented herein. However, all stationary sources developed under the Project would be required to comply with applicable MBARD rules and regulations and would be required to obtain a permit to operate from the MBARD. As previously discussed, MBARD regulates TACs from new or modified sources under Rule 1000 and a Board-approved protocol. Rule 1000 also requires sources of carcinogenic TACs to install best control technology and reduce cancer risk to less than one incident per 100,000 population. This cancer risk level would not exceed MBARD's threshold of significance for cancer risk of greater than 10 in 1 million. Furthermore, the Project would also comply with the California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, which identifies requirements for all installed appliances and fixtures.

4.2.3.3 Project Impacts and Mitigation Measures

This section provides a detailed evaluation of air quality impacts associated with the Project.

Impact AIR-1:	**Conflict with an Applicable Air Quality Plan (Threshold A).** The Project would not conflict with or obstruct implementation of the applicable air quality plan. *(Less than Significant)*

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The most recent air quality plan is the 2012–2015 AQMP, which was adopted in March 2017 and addresses the NCCAB's progress toward achieving the CAAQS for O_3 (MBARD 2017). Projects that could conflict with the attainment of the CAAQS for O_3 would be considered to conflict with the AQMP. The general criteria, as provided in MBARD's 2016 Guidelines (Figure 5-1), for determining if a project would conflict with or obstruct implementation of the AQMP are: (1) whether the project would exceed the 2016 Guidelines' CEQA thresholds of significance for O_3 precursors (ROG and NO_x) and could delay the timely attainment of the ambient air quality standards or interim emission reductions of the AQMP; and/or (2) whether the project would result in demographic growth that would exceed the forecasts included in the AQMP.

Regarding demographic growth, the 2012-2015 AQMP's future emissions forecasts are primarily based on demographic and economic growth projections provided by the Association of

Monterey Bay Area Governments (AMBAG) in the 2014 Regional Growth Forecast (MBARD 2017). The 2012-2015 AQMP includes growth projections for Monterey County of 495,086 people in 2035, which is based on the 2014 Regional Growth Forecast (AMBAG 2014). Given that the Project growth is accommodated by the 2014 Regional Growth Forecast that was used to formulate the 2012-2015 AQMP's future emissions forecasts, the Project would not exceed the growth projections incorporated into the AQMP.

To address the criterion of whether the Project would exceed the 2016 Guidelines' significance thresholds for O_3 precursors and potentially delay the timely attainment of the ambient air quality standards or interim emission reductions of the AQMP, an air quality modeling analysis that identified the Project's impact on air quality was performed. This is presented below in Impact AIR-2. In summary, the Project would not result in construction emissions or long-term operational emissions that would exceed the respective MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$. Therefore, the Project would not conflict with or obstruct implementation of the 2012–2015 AQMP and this impact would be *less than significant*.

Near-Term Development Components

Academic IV, Academic V, and the Student Recreation Center Phases I and II would provide for FTE building capacity such that CSUMB could incrementally increase student enrollment on the campus. This enrollment growth and associated growth in faculty, staff, and their families would be a component of the growth identified above for the Project. As previously discussed, the Project would include an enrollment cap increase to 12,700 FTES. This growth is accounted for in AMBAG's 2014 Regional Growth Forecast. Therefore, the near-term development components would not result in substantial population growth and would not exceed AMBAG growth projections.

As shown in Tables 4.2-6 and 4.2-7 (see the Impact AIR-2 discussion below), an air quality modeling analysis was performed in order to identify the Project's (including the near-term development components) impact on air quality. As shown in Impact AIR-2 below, the Project's construction and operational emissions would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$. As the near-term development components are a component of the Project, these components also would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$.

Therefore, the Project's near-term development components would also not conflict with or obstruct implementation of the 2012–2015 AQMP and this impact would be *less than significant*.

Mitigation Measures

Mitigation measures are not required because a significant impact has not been identified.

Impact AIR-2:	**Criteria Pollutant Emissions (Threshold B).** The Project would result in emissions of criteria pollutants, but would not exceed adopted thresholds of significance, violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the Project would not result in a cumulatively considerable net increase of a criteria pollutant for which the Project region is in nonattainment under an applicable federal or state ambient air quality standard. *(Less than Significant)*

Master Plan

Construction Emissions

Construction of the Project is anticipated to occur through 2035 and would result in the addition of pollutants to the local airshed caused by on-site mobile and stationary sources (i.e., off-road construction equipment, soil disturbance, and building material and coating off-gassing) and off-site mobile sources (i.e., on-road haul trucks and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and for dust, the prevailing weather condition. Therefore, such emission levels can only be approximately estimated.

As discussed under Construction Emissions in Section 4.2.3.2, Analytical Method, the daily construction emissions for the Project were determined based on the conservative estimate that up to approximately 300,000 GSF of buildings could be constructed concurrently. For purposes of estimating Project emissions, default phasing parameters were used which were derived from CalEEMod because the Project details for construction of future development under the Project are not yet available. Notably, the models do not need to use the exact commencement and completion dates to accurately represent the Project construction emissions. Assuming an earlier start date to estimate construction emissions would be conservative, because state and local regulations, restrictions, and increased market penetration of cleaner construction equipment (Tier 4) are anticipated to continue to reduce emissions in the future. In other words, because California's construction-related emission sources are regulated, Project construction emissions are reasonably expected to continue to decline as Tier 4 construction equipment becomes more widely available. Thus, emissions impacts are likely to be overstated and emissions would likely decrease compared to the parameters used in the analysis over buildout of the Project. Therefore, the analysis and modeling included herein provide a conservative assessment of the Project's construction-related air pollutant emissions.

Fugitive dust would result to PM_{10} and $PM_{2.5}$ emissions. Internal combustion engines used by construction equipment, haul trucks, and worker vehicles would result in emissions of ROG,

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 ROG emissions. As mentioned in the regulations discussed under Section 4.2.2.3, MBARD Rules 425 and 426 would limit ROG emissions from use of asphalt and architectural coatings, respectively.

Table 4.2-6 presents the estimated maximum daily construction emissions generated during construction. Details of the emission calculations are provided in Appendix D. As shown in Table 4.2-6, maximum daily construction emissions associated with the Project would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10} or $PM_{2.5}$. As such, Project impacts associated with construction emissions would be *less than significant*.

Table 4.2-6
Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Construction Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2022	3.24	33.14	22.61	0.05	10.61	6.07
2023	88.30	18.04	21.90	0.05	2.45	1.15
Maximum daily emissions	**88.30**	**33.14**	**22.61**	**0.05**	**10.61**	**6.07**
MBARD threshold	*137*	*137*	*550*	*N/A*	*82*	*55*
Threshold exceeded?	**No**	**No**	**No**	**N/A**	**No**	**No**

Source: Appendix D.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; MBARD = Monterey Bay Air Resources District; N/A = Not applicable.
The values shown are the maximum summer or winter daily emissions results from CalEEMod.

Operational Emissions

As described in Operational Emissions in Section 4.2.3.2, Analytical Method, Project-related operational sources of air pollutant emissions would include natural gas combustion, on-road vehicles, and area sources (i.e., use of consumer products, architectural coatings for repainting, and landscaping equipment). Table 4.2-7 presents the estimated maximum daily operational emissions generated during the first full year of Project operations after buildout (year 2035). The estimated existing campus emissions in 2017 were subtracted from the emissions attributable to Project-related campus development (both new development and redevelopment) and existing campus development that would remain with Project implementation, and the net change in emissions is compared with the MBARD significance thresholds. As indicated in Section 4.2.3.2, Project emissions include all proposed development described in Chapter 3, Project Description, and all existing campus development that will remain with the Project. Details of the emission calculations are provided in Appendix D.

Table 4.2-7
Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Emission Source	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Project Buildout						
Area sources	157.21	8.57	742.84	0.04	4.13	4.13
Energy	3.27	29.73	24.97	0.18	2.26	2.26
Motor vehicles	32.10	18.37	167.53	0.04	0.96	0.31
Total Project emissions	192.58	56.67	935.34	0.26	7.35	6.70
Existing Conditions						
Area sources	91.19	5.02	432.73	0.02	2.36	2.36
Energy	1.64	14.93	12.54	0.09	1.13	1.13
Motor vehicles	46.87	22.45	163.80	0.04	0.53	0.22
Total Existing emissions	139.70	42.40	609.07	0.15	4.02	3.71
Net increase (Project minus Existing emissions)	**52.88**	**14.27**	**326.27**	**0.11**	**3.33**	**2.99**
MBARD threshold	*137*	*137*	*550*	*N/A*	*82*	*55*
Threshold exceeded?	**No**	**No**	**No**	**N/A**	**No**	**No**

Source: Appendix D.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; MBARD = Monterey Bay Air Resources District; N/A = Not applicable.
The values shown are the maximum summer or winter daily emissions results from CalEEMod.

As shown in Table 4.2-7, the net increase in daily operational emissions for the Project would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, or $PM_{2.5}$. As such, Project operational impacts would be *less than significant*.

Near-Term Development Components

Construction Emissions

Emissions from construction activities associated with the Project's near-term development components were estimated using CalEEMod. Specific construction schedule sequencing and subphases for the near-term development components have not yet been determined; therefore, a conceptual construction scenario was developed for the purpose of estimating the maximum daily emissions as shown in Construction Emissions in Section 4.2.3.2, Analytical Method. Specifically, Project construction emissions were based on a construction scenario where no more than approximately 300,000 GSF would be developed concurrently, which is greater than the GSF for any of the individual near-term development components, as follows: Academic IV (95,000 GSF), Academic IV (76,704 GSF), Recreation Center Phases I and II (70,000 GSF), Student Housing Phase IIB (160,000 GSF), and Student Housing Phase III (200,000 GSF).

Predicted construction emissions for the worst-case day are presented in Table 4.2-6 and are compared to the MBARD significance thresholds. As shown in Table 4.2-6 above, maximum daily construction emissions associated with short-term construction activities associated with approximately 300,000 GSF of building space under construction concurrently would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, or $PM_{2.5}$. Given that each of the near-term development components would be well under 300,000 GSF, as demonstrated above, estimated construction emissions of criteria air pollutants associated with each near-term development component would be less than the emissions presented in Table 4.2-6 and therefore also would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, or $PM_{2.5}$. As such, construction emissions impacts associated with the Project's near-term development components would be *less than significant.*

Operational Emissions

As described in Operational Emissions in Section 4.2.3.2, Analytical Method, Project-related operational sources of air pollutant emissions would include natural gas combustion, on-road vehicles, and area sources (i.e., use of consumer products, architectural coatings for repainting, and landscaping equipment). As shown in Table 4.2-7 the Project's (including the near-term development components) daily operational emissions would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, or $PM_{2.5}$. Given that each near-term development component would be a subset of the larger Project, operational emissions of criteria air pollutants for each near-term development component would be less than the emissions presented in Table 4.2-7 and therefore also would not exceed the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, or $PM_{2.5}$. As such, operational impacts of the Project's near-term development components would be *less than significant.*

Mitigation Measures

Mitigation measures are not required because a significant impact has not been identified. However, as discussed in Section 4.6, Greenhouse Gas Emissions, the implementation of MM-GHG-1 would decarbonize existing buildings and/or new buildings to reduce the Project's natural gas consumption as demonstrated in Section 4.6, GHG Emissions (Table 4.6-7 and Table 4.6-8), providing an additional reduction compared with the criteria air pollutant emissions presented herein, from natural gas consumption.

Impact AIR-3:	**Exposure of Sensitive Receptors (Threshold C).** The Project would not expose sensitive receptors to substantial pollutant concentrations. *(Less than Significant)*

Master Plan

Health Effects of Toxic Air Contaminants

As previously discussed, TACs are defined as substances that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal HAPs, and has adopted and/or is adopting appropriate control measures for sources of these TACs, as described in Section 4.2.2, Regulatory Framework.

During Project construction, DPM would be the primary TAC emitted from diesel-fueled equipment and trucks. The following is required by state law to reduce DPM emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-Use Off-Road Diesel Vehicles (Cal. Code Regs., tit. 13, chapter 9, § 2449), the purpose of which is to reduce DPM and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles.
- All commercial diesel vehicles are subject to requirements limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to 5 minutes; electric auxiliary power units should be used whenever possible (Cal. Code Regs., tit. 13, chapter 10, § 2485).

The closest existing off-site sensitive receptors to the Project site include residences located in Marina on Eighth Street approximately 0.25 miles to the north, the Dual Language Academy of the Monterey Peninsula approximately 0.63 miles to the south, the VA Monterey Outpatient Clinic approximately 0.66 miles to the west, George C. Marshall Elementary School approximately 0.73 miles to the south and future residents associated with the Campus Town Specific Plan adjacent to the campus's southern boundary. Furthermore, on-site sensitive receptors would include the future Monterey Bay Charter School and existing CSUMB Childcare Center.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. MBARD's Rule 1000 requires sources of TACs to install best control technology and reduce cancer risk to less than one incident per 100,000 population, which is equivalent to MBARD's incremental cancer risk threshold of significance of 10 in 1 million. "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period will contract cancer based on the use of standard OEHHA risk-assessment methodology. In addition, some TACs have noncarcinogenic effects. The MBARD recommends a Hazard Index of 1 or more for acute (short-term) and chronic (long-term) effects.[4]

DPM emissions would be emitted from off-road equipment operations and heavy-duty trucks. Off-road construction equipment and commercial trucks are subject to ATCMs to reduce diesel particulate emissions. Applicable ATCMs to the Project would include limiting heavy-duty diesel motor vehicle and off-road construction equipment idling in order to reduce public exposure to DPM and other TACs. In general, it prohibits idling for more than 5 minutes. As described in Table 4.2-6 above, PM_{10} (representative of DPM) emissions would be minimal. According to OEHHA, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period for the maximally exposed individual resident; however, such assessments should be limited to the period/duration of activities associated with the project. Total Project construction is anticipated to occur through 2035. However, since the Project involves construction of multiple phases in multiple areas within the CSUMB campus, the Project would not require the extensive use of heavy-duty construction equipment or diesel trucks concentrated in any one location over the entire duration of development, which would limit the exposure of any proximate individual sensitive receptor to TACs. Due to the relatively short period of exposure at any individual sensitive receptor and minimal particulate emissions generated, TACs emitted during construction would not be expected to result in concentrations causing significant health risks; therefore, impacts would be *less than significant.*

With regard to long-term operations, the Project could result in TAC emissions from on-site generators; however, the specifics from such sources are unknown at the time of this analysis. In addition, potential delivery trucks would generate minimal DPM emissions based on the infrequent usage. On-site generators would result in TAC emissions; however, stationary sources, such as these generators, would be required to comply with the MBARD permitting process, which would ensure that potential health risks would be less than significant before issuing a permit to operate. Therefore, the Project would not result in exposure of sensitive receptors to substantial TAC concentrations during long-term operations and impacts would be *less than significant.*

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4 Non-cancer adverse health risks are measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentrations of the various noncarcinogens from the Project to published reference exposure levels that can cause adverse health effects.

Health Impacts of Carbon Monoxide

Mobile source impacts occur on two scales of motion. Regionally, Project-related travel would add to regional trip generation and increase the VMT within the local airshed and the NCCAB. Locally, Project-generated traffic would be added to the county roadway system near the campus. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-Project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of substantially elevated and localized CO emissions, such as around congested intersections.

During construction, the Project would result in CO emissions from construction worker vehicles, haul trucks, and off-road equipment. Title 40, section 93.123(c)(5) of the California Code of Regulations, Procedures for Determining Localized CO, PM_{10}, and $PM_{2.5}$ Concentrations (hot-spot analysis), states that "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site" (Cal. Code Regs., tit. 40, § 93.123). Since construction activities would be temporary and spread out across multiple work sites throughout the construction buildout duration (which would disperse localized CO emissions), a Project-level construction hotspot analysis would not be required.

Additionally, because the Project would result in long-term CO emissions that would be less than the MBARD threshold, an operational CO hotspot evaluation is also not required. In addition, as determined by the Transportation Analysis (Appendix H), the Project would not cause intersections to decrease to LOS E or worse with improvements.

Due to 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 NCCAB is steadily decreasing as presented in Table 4.2-2. Maximum background CO levels in Monterey County as shown in Table 4.2-2 are approximately 13 percent of the 1-hour and 8-hour NAAQS and CAAQS and would be expected to improve further due to reductions in motor vehicle emissions. Thus, the Project's CO emissions would not contribute to significant health effects associated with this pollutant and the impacts would be *less than significant*.

Health Effects of Criteria Air Pollutants

As demonstrated above, construction and operation of the Project would not result in emissions that exceed the MBARD significance thresholds for any criteria air pollutants, including ROG, NO_x, CO, PM_{10}, or $PM_{2.5}$.

ROG emissions would be associated with motor vehicles, construction equipment, and architectural coatings. As shown in Tables 4.2-6 and 4.2-7, Project-generated ROG emissions would not result in exceedances of the MBARD significance thresholds, Furthermore, the Project would be required to adhere to MBARD Rules 425 and 426, which restricts the VOC content of coatings.

ROG and NO_x are precursors to O_3, for which the NCCAB is designated as nonattainment with respect to the CAAQS. The health effects associated with O_3 are generally associated with reduced lung function. The contribution of ROG and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the NCCAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the precursor emissions would occur because exceedances of the O_3 AAQS tend to occur between April and October when solar radiation is highest. The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods to assess this impact. Nonetheless, because ROG and NO_x emissions associated with Project construction and/or operation would not exceed the MBARD significance thresholds, it is not anticipated the Project would contribute substantially to regional O_3 concentrations and the associated health effects.

Construction and operation of the Project also would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Health effects that result from NO_2 (a constituent of NO_x) include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, off-road construction equipment would be operating at multiple locations of the CSUMB campus and would not be concentrated in one portion of the campus at any one time. In addition, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards and construction and operation of the Project would not create substantial NO_x emissions. Therefore, the Project is not anticipated to result in potential health effects associated with NO_2.

CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots were discussed previously and are determined to be a less-than-significant impact. Furthermore, the existing CO concentrations in the area are well below the NAAQS and CAAQS standards. Thus, the Project's CO emissions would not contribute to significant health effects associated with this pollutant.

Construction and operation of the Project would also not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the NCCAB from coming into attainment for these pollutants. Due to the minimal contribution of PM_{10} and $PM_{2.5}$ during construction and operation, it is not anticipated that the Project would result in potential health effects related to particulate matter.

In summary, because construction and operation of the Project would not result in exceedances of the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$, and because the MBARD thresholds are based on levels that the NCCAB can accommodate without affecting the attainment date for the CAAQS and the CAAQS are established to protect public health and welfare, it is anticipated that the Project would not result in health effects associated with criteria air pollutants and the impact would be *less than significant*.

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

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

In requiring a health impact type of analysis for criteria air pollutants, it is important to understand how O_3 and PM is formed, dispersed and regulated. The formation of O_3 and PM in the atmosphere, as secondary pollutants,[5] 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 (NO). 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

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

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 2008). 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 (SJVAPCD 2015). PM can be divided into two categories: directly emitted PM and secondary PM. Secondary PM, like O_3, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as SO_x and NO_x (SJVAPCD 2015). 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 (SJVAPCD 2015). This is especially true for individual projects, like the Project, where project-generated criteria air pollutant emissions are not derived from a single "point source," but from construction equipment and mobile sources (passenger cars and trucks) driving to, from and around each construction site.

Another important technical nuance is that health effects from air pollutants are related to the concentration of the air pollutant that an individual is exposed to, not necessarily the individual mass quantity of emissions associated with an individual project. For example, health effects from O_3 are correlated with increases in the ambient level of O_3 in the air a person breathes (SCAQMD 2015). However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient O_3 levels over an entire region (SCAQMD 2015). The lack of link between the tonnage of precursor pollutants and the concentration of O_3 and $PM_{2.5}$ formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects; rather, it is the concentration of resulting O_3 that causes these effects (SJVAPCD 2015). Indeed, the ambient air quality standards, which are statutorily required to be set by EPA at levels that are requisite to protect the public health, are established as concentrations of O_3 and $PM_{2.5}$ and not as tonnages of their precursor pollutants (EPA 2018d). 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 AAQS, 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 (SJVAPCD 2015).

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

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

Nonetheless, following the Supreme Court's Friant Ranch decision, some EIRs where estimated criteria air pollutant emissions exceeded applicable air district thresholds have included a quantitative analysis of potential project-generated health effects using a combination of a regional photochemical grid model (PGM)[6] and the EPA Benefits Mapping and Analysis Program (BenMAP or BenMAP–Community Edition [CE]).[7] 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 $PM_{2.5}$.[8] To date, the five publicly available HIAs reviewed

6 The first step in the publicly available HIAs includes running a regional PGM, such as the Community Multiscale Air Quality (CMAQ) model or the Comprehensive Air Quality Model with extensions (CAMx) to estimate the increase in concentrations of O_3 and $PM_{2.5}$ as a result of project-generated emissions of criteria and precursor pollutants. Air districts, such as the SCAQMD, use photochemical air quality models for regional air quality planning. These photochemical models are large-scale air quality models that simulate the changes of pollutant concentrations in the atmosphere using a set of mathematical equations characterizing the chemical and physical processes in the atmosphere (EPA 2017).

7 After estimating the increase in concentrations of O_3 and $PM_{2.5}$, the second step in the five examples includes use of BenMAP or BenMAP-CE to estimate the resulting associated health effects. BenMAP estimates the number of health incidences resulting from changes in air pollution concentrations (EPA 2018e). 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 $PM_{2.5}$.

8 The following CEQA documents included a quantitative HIA to address Friant Ranch: (1) California State University Dominguez Hills 2018 Campus Master Plan EIR (CSU Dominguez Hills 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), and (5) San Diego State University Mission Valley Campus Master Plan EIR (SDSU 2019).

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 five 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 $PM_{2.5}$.

As explained in the SJVAPCD brief and noted previously, running the PGM 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 five examples reviewed support the SJVAPCD's brief contention that consistent, reliable, and meaningful results may not be provided by methods applied at this time. 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 PGM 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.

Near-Term Development Components

Health Effects of Toxic Air Contaminants

The greatest potential for TAC emissions would be DPM emissions from heavy equipment operations and heavy-duty trucks during construction activities for the Project's near-term development components and the associated potential health impacts to sensitive receptors. According to OEHHA, health risk assessments (which determine the exposure of sensitive receptors to toxic emissions) should be based on a 30-year exposure period for the maximally exposed individual receptor; however, such assessments should also be limited to the period/duration of activities associated with the Project's near-term development components. Construction of the Project's near-term development components would represent a short duration of exposure of the 30-year exposure period, while cancer and chronic risk from DPM are typically associated with long-term exposure. Thus, the near-term development components would not result in a long-term source of TAC emissions.

Furthermore, the Project's near-term development components construction would not require the extensive operation of heavy-duty diesel construction equipment, which is subject to CARB's Airborne Toxics Control Measure for in-use diesel construction equipment to reduce DPM emissions, and would not involve extensive use of diesel trucks, which are also subject to a CARB Airborne Toxics Control Measure. Due to this relatively short period of exposure and minimal DPM emissions on site, TACs generated during the Project's near-term development components construction would not result in concentrations causing significant health risks; therefore, impacts would be *less than significant*.

Regarding long-term operations, the near-term development components could result in TAC emissions from on-site generators. In addition, potential delivery trucks would generate minimal DPM emissions based on the infrequent usage. The on-site generators, which are classified as stationary sources, would be required to comply with MBARD's permitting process, such as Rule 1000's requirement that new sources of TACs install best control technology prior to issuance of permits to operate. Compliance with this regulatory framework would ensure that potential health risks would be less than significant. Therefore, the near-term development components would not result in exposure of sensitive receptors to substantial TAC concentrations during long-term operations and impacts would be *less than significant*.

Health Impacts of Carbon Monoxide

During construction, the Project's near-term development components would result in CO emissions from construction worker vehicles, haul trucks, and off-road equipment. Title 40, section 93.123(c)(5) of the California Code of Regulations, Procedures for Determining Localized CO, PM_{10}, and $PM_{2.5}$ Concentrations (hot-spot analysis), states that "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site" (Cal. Code Regs., tit. 40, § 93.123). Since construction activities would be temporary and spread out across multiple work sites throughout, a Project-level construction hotspot analysis would not be required. Additionally, the near-term development components are included in the Project's buildout emissions presented in Table 4.2-7, which identified long-term CO emissions that would be less than the MBARD threshold. Therefore, an operational CO hotspot evaluation is also not required.

Due to 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 NCCAB is steadily decreasing as presented in Table 4.2-2. Maximum background CO levels in Monterey County as shown in Table 4.2-2 are approximately 13 percent of the 1-hour and 8-hour NAAQS and CAAQS and would be expected to improve further due to reductions in motor vehicle emissions. Thus, the near-term development component's CO emissions would not contribute to significant health effects associated with this pollutant and the impacts would be *less than significant*.

Health Effects of Criteria Air Pollutants

The Project's near-term development components would not exceed significance thresholds for ROG, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. ROG and NO_x are precursors to O_3, for which the NCCAB is designated as nonattainment with respect to the CAAQS. The health effects associated with O_3 are generally associated with reduced lung function. The contribution of ROGs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the NCCAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the ROG emissions would occur because exceedances of the O_3 CAAQS tend to occur between April and October when solar radiation is highest. The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods to assess this impact. Operation of the near-term development components would not exceed the significance threshold for NO_x; therefore, implementation of the near-term development components would contribute minimally to regional O_3 concentrations and the associated health effects.

Operation of the near-term development components also would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Health effects that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. The near-term development components construction would be relatively short term, and off-road construction equipment would be operating at various portions of the campus and would not be concentrated in one location of the site at any one time. In addition, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Because the near-term development components generated NO_x emissions would not exceed the significance threshold, the near-term components would not result in potential health effects associated with NO_2 and NO_x.

CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots was discussed previously and determined to be a less-than-significant impact. Furthermore, the existing CO concentrations in the area are well below the NAAQS and CAAQS standards. Thus, the near-term development components' CO emissions would not contribute to significant health effects associated with this pollutant.

Construction and operation of the near-term development components would also not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter. Due to the minimal contribution of particulate matter during construction and operation, the near-term development components are not anticipated to result in health effects associated with PM_{10} or $PM_{2.5}$.

In summary, because the near-term development components would not result in exceedances of the significance thresholds for emissions of ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$ during construction and operations, the potential health effects associated with criteria air pollutants are considered less than significant. Furthermore, 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 there are currently no modeling tools that could provide reliable and meaningful additional information regarding health effects from criteria air pollutants generated by individual projects. Therefore, the near-term development components would not result in health effects associated with criteria air pollutants and the impact would be *less than significant*.

Mitigation Measures

Mitigation measures are not required because a significant impact has not been identified.

Impact AIR-4:	**Other Emissions Adversely Affecting a Substantial Number of People (Threshold D).** The Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. *(Less than Significant)*

Master Plan

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

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

Typical sources of substantial operational odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries. Regarding operations, the Project involves development of additional CSUMB campus facilities (non-residential) and housing (residential) uses. Typical odors generated from operation of the Project would include vehicle exhaust generated by students, employees, or visitors traveling to and from the Project site, through the periodic use of landscaping or maintenance equipment, from the temporary storage of typical solid waste (refuse), and from the dining facilities. Any odors produced would be minimal, would be similar to the existing uses, and would be confined to the immediate campus vicinity. Overall, operation of the Project would not result in odors that would affect a substantial number of people and this impact would be *less than significant*.

Near-Term Development Components

Construction odors related to vehicles and equipment exhaust emissions would disperse rapidly from the near-term development component sites and generally occur at magnitudes that would not affect a substantial number of people. The Project's near-term development components would not result in substantial objectionable odors when operated in compliance with regulations (e.g., proper trash disposal and storage). The near-term development components also do not contain any uses or activities that would cause the generation of substantial unpleasant odors. Thus, construction and operation of the Project's near-term development components would not result in the creation of objectionable odors affecting a substantial number of people. Impacts related to odors would be *less than significant*.

Mitigation Measures

Mitigation measures are not required because a significant impact has not been identified.

4.2.3.4 Cumulative Impacts

This section provides an evaluation of air quality impacts associated with the Project, including near-term development components, and other planned growth in the study area, based both on the 2018 AMBAG Regional Growth Forecast and based on other reasonably foreseeable cumulative development, as identified in Table 4.0-1 in Section 4.0, Introduction to Analysis, and as relevant to the particular air quality issue evaluated. The geographic area considered in the cumulative analysis for this topic is described in the impact analysis below.

Impact AIR-5:	**Cumulative Air Quality Impacts (Thresholds A, B, C and D).** The Project would not result in a considerable contribution to a significant cumulative impact related to air quality. *(Less than Significant)*

Air Quality Management Plan

Consistency with the AQMP is determined, in part, by comparing cumulative population growth to the population forecasts contained in the AQMP for Monterey County, which is the geographic context for the analysis of potential conflicts with the AQMP due to cumulative development. As indicated in Impact AIR-1, demographic growth forecasts developed by AMBAG were used to estimate future emissions in the 2012–2015 AQMP. The estimated growth anticipated by the 2012-2015 AQMP and AMBAG was 495,086 people by 2035. While there could be future projects proposed within Monterey County that were not anticipated by the AMBAG growth forecasts that could cause exceedance of the forecasts contained in the AQMP, the evaluation of such impacts would be speculative at this time. Further, subsequent Regional Growth Forecasts in 2018 and 2022 reveal that population projections are going down in Monterey over time and, therefore, the higher 2014 population estimates for Monterey County used in the AQMP are likely to account for cumulative development. Therefore, significant conflicts with the AQMP are not likely to result with cumulative development in Monterey County. Furthermore, the Project would be consistent with the AQMP, as discussed in Impact AIR-1. Therefore, the cumulative impact related to conflicts with the AQMP would be *less than significant*.

Criteria Air Pollutants

Air pollution by nature is largely a cumulative impact. The entire NCCAB is the geographic context for the evaluation of cumulative air quality impacts related to criteria air pollutants. The nonattainment status of regional pollutants is a result of past and present development, and the MBARD develops and implements plans for future attainment of ambient air quality standards within the NCCAB. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. The potential for the Project to result in a cumulatively considerable impact, specifically a cumulatively considerable new increase of any criteria air pollutant for which the Project region is nonattainment under an applicable NAAQS and/or CAAQS, is addressed in Impact AIR-2 above. As previously discussed, daily construction and the net operational emissions of the Project would not exceed the MBARD significance thresholds for any criteria air pollutant including ROG, NO_x, CO, PM_{10}, or $PM_{2.5}$. Therefore, construction and operational cumulative air quality impacts would be *less than significant*.

Substantial Pollutant Concentrations

The entire NCCAB is the geographic context for the evaluation of cumulative air quality impacts related to substantial pollutant concentrations and related health effects. As addressed in Impact AIR-3, because construction and operation of the Project would not result in the exceedances of the MBARD significance thresholds for ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$, and because the MBARD thresholds are based on levels that the NCCAB can accommodate without affecting the attainment date for the AAQS and the AAQS are established to protect public health and welfare, it is anticipated that the Project would not result in cumulative health effects associated with criteria air pollutants and the impact would be *less than significant*.

Notably, 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. However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient O_3 levels over an entire region (SCAQMD 2015). 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 campus on a particular day or month of the year, or what specific health impacts will occur. Furthermore, 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 there are currently no modeling tools that could provide reliable and meaningful additional information regarding health effects from criteria air pollutants generated by individual projects.

Odors

As indicated in Impact AIR-4, the Project impact related to odor would also be *less than significant*. As odors are a localized impact, the geographic scope considered in the cumulative analysis related to odors consists of the cumulative projects identified in Table 4.0-1 in Section 4.0, Introduction to Analysis. None of the cumulative projects listed in Table 4.0-1 are odor-producing land uses, such as those listed under Impact AIR-4. The MBARD does not have a specific regulation or rule that addresses objectionable odors. Any actions related to odors would be based on public complaints made to the MBARD. Additionally, all future projects would be subject to MBARD Rule 402 (Nuisances), which prohibits the discharge of air contaminants or other materials which cause 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 persons or the public; or which cause, or have a natural tendency to cause, injury or damage to business or property. Therefore, cumulative impacts related to odor would be *less than significant*.

4.2.4 References

AMBAG (Association of Monterey Bay Area Governments). 2014. *2014 Regional Growth Forecast Technical Documentation*. June 11, 2014. Accessed November 2021 at https://ambag.org/sites/default/files/2019-12/FINAL%20Adopted%20Forecast%20and%20Documentation_0.pdf

AMBAG. 2018. *2018 Regional Growth Forecast: Technical Documentation*. Adopted June 13, 2018. Accessed August 8, 2018 at http://ambag.org/sites/default/files/documents/2018_Regional_Growth_Forecast.pdf.

AMBAG. 2020. *Final 2022 Regional Growth Forecast Memorandum*. Accepted for planning purposes on November 18, 2020. Accessed August 8, 2021 at https://www.ambag.org/sites/default/files/2020-12/Final%20Draft%202022%20Regional%20Growth%20Forecast_PDF_A.pdf

CARB (California Air Resources Board). 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October 2000. Accessed October 2018. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf.

CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005. Accessed August 2016. https://www.arb.ca.gov/ch/handbook.pdf.

CARB. 2009. "ARB Fact Sheet: Air Pollution Sources, Effects and Control." Page last reviewed December 2, 2009. Accessed May 2019. https://www.arb.ca.gov/research/health/fs/fs2/fs2.htm.

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

CARB. 2016b. 2016 Mobile Source Strategy. May 2016. Accessed November 2021. https://ww3.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf.

CARB. 2017a. Inhalable Particulate Matter and Health ($PM2_{.5}$ and PM_{10}). Page last reviewed August 10, 2017. Accessed May 2019. https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm.

CARB. 2019a. "Glossary." Accessed January 2019. https://ww2.arb.ca.gov/about/glossary.

CARB. 2019b. "Ozone & Health." Accessed May 2019. https://ww2.arb.ca.gov/resources/ozone-and-health.

CARB. 2019c. "Nitrogen Dioxide & Health." Accessed May 2019. https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health.

CARB. 2019d. "Carbon Monoxide & Health." Accessed May 2019. https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health.

CARB. 2019e. "Sulfur Dioxide & Health." Accessed May 2019. https://ww2.arb.ca.gov/resources/sulfur-dioxide-and-health.

CARB. 2020. "Area Designations Maps/State and National." Maps dated August 2020. Accessed July 2021. http://www.arb.ca.gov/desig/adm/adm.htm.

CARB. 2021a. "Ambient air quality data." [digital CARB data]. iADAM: Air Quality Data Statistics. Accessed November 2021. http://www.arb.ca.gov/adam/topfour/topfour1.php.

CARB. 2021b. Advanced Clean Trucks Fact Sheet. August 20, 2021. Accessed November 2021. https://ww2.arb.ca.gov/sites/default/files/2021-08/200625factsheet_ADA.pdf.

CARB. 2021c. 2020 Mobile Source Strategy. September 2021. Accessed November 2021. https://ww2.arb.ca.gov/sites/default/files/2021-09/Proposed_2020_Mobile_ Source_Strategy.pdf.

CAPCOA (California Air Pollution Control Officers Association). 2021. *California Emissions Estimator Model (CalEEMod) User's Guide Version 2020.4.0*. Prepared by BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts. Accessed July 2021. http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4.

City of Inglewood. 2019. *Inglewood Basketball and Entertainment Center Project EIR* (State Clearinghouse No. [SCH#] 2018021056). http://ibecproject.com/D_AirQuality.pdf.

City of San Jose. 2019. *Mineta San Jose Airport Amendment to the Airport Master Plan EIR* (SCH# 2018122051). https://www.sanjoseca.gov/Home/ShowDocument?id=44596.

County of Monterey. 2008. *2007 Monterey County General Plan Draft EIR* (SCH 2007121001). September 2008.

CSU Dominguez Hills (California State University Dominguez Hills). 2019. *California State University Dominguez Hills Campus Master Plan EIR* (SCH# 2017081035). https://www.csudh.edu/ Assets/csudh-sites/fpcm/docs/campus-master-plan/2019-09-11-FEIR-appendices.pdf.

CSUMB (California State University Monterey Bay). 2022. California State University, Monterey Bay Housing Guidelines. February 2022.

CSU Office of the Chancellor. 2019. Preliminary Five-Year Plan 2020/2021 through 2024/2025. Accessed October 2019. https://calstate.edu/cpdc/Facilities_Planning/documents/ Preliminary-Five-Year-Plan-2020-2025.pdf.

EPA (U.S. Environmental Protection Agency). 2008. *Final Ozone NAAQS Regulatory Impact Analysis*. March 2008. https://www3.epa.gov/ttnecas1/regdata/RIAs/452_R_08_003.pdf.

EPA. 2009. *Integrated Science Assessment for Particulate Matter.* EPA/600/R-08/139F. Research Triangle Park, North Carolina: (U.S. Environmental Protection Agency. December 2009. Accessed October 2018. http://ofmpub.epa.gov/eims/eimscomm.getfile?p_ download_id=494959.

EPA. 2013. *Integrated Science Assessment for Ozone and Related Photochemical Oxidants*. EPA/600/R-10/076F. Research Triangle Park, North Carolina: (U.S. Environmental Protection Agency. February 2013. Accessed October 2018. https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=247492.

EPA. 2016. *Integrated Science Assessment for Oxides of Nitrogen—Health Criteria*. EPA/600/R-15/068. Research Triangle Park, North Carolina: (U.S. Environmental Protection Agency. January 2016. Accessed October 2018. https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=310879.

EPA. 2018. "Criteria Air Pollutants." March 8, 2018. Accessed October 2018. https://www.epa.gov/criteria-air-pollutants.

EPA. 2020a. "EPA Region 9 Air Quality Maps and Geographic Information." July 19, 2021. Accessed July 2021. http://www.epa.gov/region9/air/maps.

EPA. 2021. "Air Data: Access to Air Pollution Data." Updated November 2, 2021. Accessed November 2021. https://www.epa.gov/outdoor-air-quality-data.

March JPA (March Joint Powers Association). 2019. K4 Warehouse and Cactus Channel Improvements EIR (SCH# 2018111036). https://www.marchjpa.com/documents/docs_forms/K-4_Final_Draft_EIR.pdf.

MBARD (Monterey Bay Air Resources District). 2005. *2005 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region*. December 1, 2005.

MBARD. 2007. *2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region.* Approved March 21, 2007.

MBARD. 2008. *CEQA Air Quality Guidelines*. Adopted October 1995 and latest revision in February 2008.

MBARD. 2016. *Guidelines for Implementing the California Environmental Quality Act*. Adopted April 1996 and revised February 2016.

MBARD. 2017. *2012-2015 Air Quality Management Plan*. Adopted March 15, 2017. Accessed February 2019. http://mbard.org/wp-content/uploads/2017/03/2012-2015-AQMP_FINAL.pdf.

NRC (National Research Council of the National Academies). 2005. *Interim Report of the Committee on Changes in New Source Review Programs for Stationary Sources of Air Pollutants*. Washington, DC: The National Academies Press. Accessed May 2019.

https://doi.org/10.17226/11208.Page. 2020. California State University Monterey Bay Master Plan Guidelines. DRAFT. January 2020.

SCAQMD (South Coast Air Quality Management District). 2015. Brief of Amicus Curiae in Support of Neither Party, *Sierra Club v. County of Fresno*, Case No. S219783 (filed Apr. 13, 2015). https://www.courts.ca.gov/documents/9-s219783-ac-south-coast-air-quality-mgt-dist-041315.pdf.

SDSU (San Diego State University). 2019. San Diego State University Mission Valley Campus Master Plan EIR Additional Information Regarding Potential Health Effects of Air Quality Impacts (SCH# 2019011042). December 2019. https://missionvalley.sdsu.edu/assets/pdfs/FEIR/appendices/4_2_3_SDSU_MV_Health_Effects_Memo.pdf.

SJVAPCD (San Joaquin Valley Air Pollution Control District). 2015. Brief of Amicus Curiae in Support of Defendant and Respondent, County of Fresno, and Real Party in Interest and Respondent, Friant Ranch, L.P., *Sierra Club v. County of Fresno,* Case No. S219783 (filed Apr. 13, 2015). https://www.courts.ca.gov/documents/7-s219783-ac-san-joaquin-valley-unified-air-pollution-control-dist-041315.pdf.

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