3.4 Air Quality

This section describes the environmental and regulatory setting for air quality. It also describes impacts related to air quality that would result from implementation of the Proposed Project and mitigation for significant impacts where feasible and appropriate. This section has been prepared using methods and assumptions recommended in the air quality impact assessment guidelines of the Bay Area Air Quality Management District (BAAQMD).[1] The section describes existing air quality in the region, the Proposed Project's contribution to localized concentrations of carbon monoxide (CO), impacts from vehicular emissions that have regional effects, and the exposure of sensitive receptors to Project-generated toxic air contaminants (TACs). An Air Quality Technical Report (AQTR) and health risk assessment (HRA) was prepared for the Proposed Project.[2] The information and conclusions from this document are incorporated into this section. The AQTR and HRA document is provided in Appendix 3.4-1 and the emissions modeling and calculations files are provided in Appendix 3.4-2. A supplemental memorandum to the HRA is provided in Appendix 3.4-3. A local air quality monitoring report is provided in Appendix 3.4-4.

One comment regarding local air quality monitoring near the Project Site was received in response to the Notice of Preparation (NOP). Local air quality monitoring was conducted near the Project Site and a summary of the results is provided for information purposes under "Existing Air Quality Conditions" below. Local air quality monitoring was undertaken voluntarily by the Project Sponsor and provided to the City of Menlo Park (City) for use in this environmental impact report (EIR) as background information. Local air quality monitoring was not necessary to conduct an air quality analysis in compliance with the CEQA.

Existing Conditions

Environmental Setting

This section provides a discussion of existing conditions related to air quality in the Study Area. The information below is drawn from the relevant oversight agencies, which are BAAQMD, the California Air Resources Board (CARB), and the U.S. Environmental Protection Agency (EPA).

The Project area is within the larger San Francisco Bay Area Air Basin (SFBAAB); the air basin comprises the Study Area for the Proposed Project. Ambient air quality in the Study Area is affected by climatological conditions, topography, and the types of pollutants emitted and the amounts.

The following discussion describes relevant characteristics of the SFBAAB, describes key pollutants of concern, summarizes existing ambient pollutant concentrations, and identifies sensitive receptors.

Regional Climate and Meteorology

Menlo Park is in the southern part of the SFBAAB, a large shallow air basin ringed by hills that taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist.[3] One is the strait known as the Golden Gate, a direct outlet to the Pacific Ocean. The second extends to the northeast, along the West Delta region of the Sacramento and San Joaquin Rivers.

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1 Bay Area Air Quality Management District. 2017. *California Environmental Quality Act, Air Quality Guidelines*. May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: March 15, 2022.

2 Ramboll US Corporation. 2022. *CEQA Air Quality, Greenhouse Gas and Health Risk Assessment Technical Report*. February. Accessed: February 21, 2022.

3 An atmospheric outlet is a gap between land formations that allows air to flow in and out of an area.

The city is within the jurisdiction of BAAQMD, which regulates air quality in the San Francisco Bay Area (Bay Area). Air quality conditions in the Bay Area have improved significantly since BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen dramatically. Neither the California Ambient Air Quality Standards (CAAQS) nor the National Ambient Air Quality Standards (NAAQS) for the following pollutants have been violated in recent decades: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), sulfates, lead, hydrogen sulfide, and vinyl chloride. Exceedances of air quality standards that do occur happen primarily during periods when meteorological conditions are conducive to high levels of pollution, such as cold, windless nights or hot, sunny summer afternoons.

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses or the environment. Two meteorological factors affect air quality in Menlo Park: wind and temperature. Winds affect the direction of transport for air pollution emissions; wind also controls the volume of air into which pollution is mixed over a given period of time. Although winds govern horizontal mixing processes, temperature inversions determine the vertical mixing depth of air pollutants.

Menlo Park is located in San Mateo County, which lies in the middle of the San Francisco Peninsula, south of San Francisco County and north of Santa Clara and Santa Cruz Counties. San Mateo County is bounded by the Pacific Ocean to the west and San Francisco Bay to the east. Cool, foggy weather is prevalent along the western coast of the peninsula, particularly during the summer. Summertime average daily temperatures are moderate along the western coast and warm on the county's east side. In the winter, average daily temperatures across the county range from mild to moderate. Winds are mild, with the highest wind speeds along the western coast. Rainfall averages about 20 to 25 inches per year at lower elevations and up to 36 inches in the Santa Cruz Mountains.[4]

Ozone (O_3) and fine particle pollution (i.e., particulate matter no more than 2.5 microns in diameter, or $PM_{2.5}$) are the major regional air pollutants of concern in the Bay Area. O_3 is primarily a problem in the summer; fine particle pollution is a problem in the winter.[5] In San Mateo County, O_3 levels almost never exceed health standards. $PM_{2.5}$ concentrations exceed the national standard about 1 day each year. San Mateo County frequently receives fresh marine air from the Pacific Ocean. The air passes over the coastal hills as it moves into the county. In winter, $PM_{2.5}$ may be transported into San Mateo County from other parts of the Bay Area. $PM_{2.5}$ may combine with wood smoke, which may lead to elevated concentrations. However, the concentrations are rarely high enough to exceed health standards.[6]

Pollutants of Concern

Criteria Pollutants

Both state and federal governments have established health-based ambient air quality standards for six criteria air pollutants: CO, O_3, NO_2, SO_2, lead, and suspended particulate matter. In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of

[4] Bay Area Air Quality Management District. 2019. *Climate and Air Quality in San Mateo County*. Available: https://www.baaqmd.gov/about-the-air-district/in-your-community/san-mateo-county. Accessed: March 15, 2022.

[5] Ibid.

[6] Ibid.

safety. Two criteria pollutants, O_3 and NO_2, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO_2, and lead are considered local pollutants and tend to accumulate in the air locally.

The primary pollutants of concern in the area of the Proposed Project are O_3, CO, and suspended particulate matter. Significance thresholds established by an air district are used to manage total regional and local emissions within an air basin, based on the air basin's attainment status for criteria pollutants. The emission thresholds were established for individual development projects that could contribute to regional and local emissions and adversely affect or delay the air basin's projected attainment target goals for nonattainment criteria pollutants. See the Regional Attainment Status subsection and Table 3.4-3 for information regarding the attainment status of the Study Area for the Proposed Project.

One individual project that generates emissions that exceed a threshold does not necessarily result in adverse health effects for residents in the vicinity. This condition is especially true when the criteria pollutants that exceed thresholds are those with regional effects, such as O_3 precursors (e.g., nitrogen oxides [NO_X] and reactive organic gases [ROGs]). Furthermore, by its very nature, air pollution is largely a cumulative impact. No single project is large enough by itself to result in nonattainment of ambient air quality standards. Instead, in air basins that are in nonattainment for one or more criteria air pollutants, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. Because of the conservative nature of the significance thresholds, as well as the basin-wide context of individual development project emissions, there is no direct correlation between a single project and localized air quality–related health effects. In developing thresholds of significance for air pollutants, the air districts have considered the emission levels at which a project's individual emissions would be cumulatively considerable in light of existing air quality. If a project exceeds the identified significance thresholds, its emissions would be significant and a cumulatively considerable contributor to significant cumulative air quality impacts in the region.

Occupants of facilities such as schools, day-care centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered more sensitive to air pollutants than the general public because of their increased susceptibility to respiratory disease. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas because people generally spend longer periods of time at their residences and have a greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared with commercial and industrial uses because of the greater exposure to ambient air quality conditions associated with exercise. These populations are referred to as *sensitive receptors*. Air pollutants and their health effects, as well as other air pollution–related considerations, are summarized in Table 3.4-1 and described in more detail below.

Ozone

O_3, a secondary air pollutant, is produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_X. The main sources of ROG and NO_X, often referred to as O_3 precursors, are combustion processes, including combustion in motor vehicle engines, and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the largest source of O_3 precursors. O_3 is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with O_3 production through the photochemical reaction process. O_3 causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Table 3.4-1. Sources and Health Effects of Air Pollutants

Pollutant	Sources	Primary Effects
Ozone (O_3)	• Precursor sources: motor vehicles, industrial emissions, and consumer products[a]	• Respiratory symptoms. • Worsening of lung disease, leading to premature death. • Damage to lung tissue. • Crop, forest, and ecosystem damage. • Damage to a variety of materials, including rubber, plastics, fabrics, paints, and metals.
Particulate Matter Less than 2.5 Microns in Aerodynamic Diameter ($PM_{2.5}$)	• Cars and trucks (especially diesel vehicles). • Fireplaces and wood stoves. • Windblown dust from roadways, agriculture, and construction.	• Premature death. • Hospitalization for worsening of cardiovascular disease. • Hospitalization for respiratory disease. • Asthma-related emergency room visits. • Increased symptoms and increased inhaler usage.
Particulate Matter Less than 10 Microns in Aerodynamic Diameter (PM_{10})	• Cars and trucks (especially diesel vehicles). • Fireplaces and wood stoves. • Windblown dust from roadways, agriculture, and construction.	• Premature death and hospitalization, primarily from worsening of respiratory disease. • Reduced visibility and material soiling.
Nitrogen Oxides (NO_X)	• Any source that burns fuel, such as cars, trucks, construction and farming equipment, and residential heaters and stoves.	• Lung irritation. • Enhanced allergic responses.
Carbon Monoxide (CO)	• Any source that burns fuel, such as cars, trucks, construction and farming equipment, and residential heaters and stoves.	• Chest pain in patients with heart disease. • Headaches. • Light-headedness. • Reduced mental alertness.
Sulfur Oxides (SO_x)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Worsening of asthma (e.g., increased symptoms, increased medication usage, emergency room visits).
Lead (Pb)	• Contaminated soil. • Lead-based paints.	• Impaired mental functioning in children. • Learning disabilities in children. • Brain and kidney damage.
Toxic Air Contaminants (TACs)	• Cars and trucks (especially diesel vehicles). • Industrial sources, such as chrome platers. • Neighborhood businesses, such as dry cleaners and service stations. • Building materials and products.	• Cancer. • Reproductive and developmental effects. • Neurological effects.

Source: California Air Resources Board. 2021. *Common Air Pollutants*. Available: https://ww2.arb.ca.gov/resources/common-air-pollutants. Accessed: November 2, 2021.

[a] O_3 is not generated directly by these sources. Rather, precursor pollutants from these sources (ROG and NO_X) react with sunlight to form O_3 in the atmosphere.

Carbon Monoxide

CO, an odorless, colorless gas, is usually formed as the result of incomplete combustion in fuels. The largest source of CO is the motor vehicle. CO transport is limited; it disperses with distance from a source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels and adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections that operate at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Extremely high levels of CO, such as those generated when a vehicle is running in an unventilated garage, can be fatal.

Particulate Matter

Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from man-made and natural sources. Particulate matter is categorized according to two size ranges: PM_{10} for particles less than 10 microns in diameter and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulate matter through tailpipe emissions as well as brake wear and tire wear; travel over paved and unpaved roads also results in particulate matter in the form of suspended dust particles. Fireplaces and stoves that burn wood, industrial facilities, and construction involving ground-disturbing activities are other sources of such fine particulates, which are small enough to be inhaled into the deepest parts of the human lung and cause adverse health effects. According to CARB, studies in the United States and elsewhere have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks. Studies of children's health in California have demonstrated that particle pollution may significantly reduce lung function in children.[7] Statewide attainment of particulate matter standards could reduce the number of premature deaths, hospital admissions for cardiovascular and respiratory disease, asthma-related emergency room visits, and episodes of respiratory illness in California.

Nitrogen Dioxide

NO_2, a reddish-brown gas, is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to O_3 formation, NO_2 also contributes to other pollution problems, including high concentrations of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on days with high levels of pollution, especially in conjunction with high O_3 levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide

SO_2 is a colorless acidic gas with a strong odor. It is produced from the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO_2 also reduces visibility and the level of sunlight at the ground surface.

[7] California Air Resources Board. 2021. *Inhalable Particulate Matter and Health ($PM_{2.5}$ and PM_{10}).* Available: https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health. Accessed: March 15, 2022.

Lead

Lead, a metal, is found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the EPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of EPA regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air have decreased dramatically.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, TACs are another group of pollutants of concern. Some examples of TACs include benzene, butadiene, formaldehyde, and hydrogen sulfide. Potential TAC-related health effects include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs, with varying degrees of toxicity. Individual TACs vary greatly with respect to the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards but are regulated by the EPA and CARB. In 1998, CARB identified particulate matter from diesel-fueled engines as a TAC. CARB completed a risk management process that identified potential cancer risks for a range of activities and land uses that are affected by the use of diesel-fueled engines.[8] High-volume freeways, stationary diesel engines, and facilities that attract constant and heavy volumes of diesel vehicle traffic (e.g., distribution centers, truck stops) were identified as areas that pose the highest risk for adjacent receptors. Other facilities associated with increased risk include large retail or industrial facilities, high-volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both the concentration and the duration of exposure. BAAQMD regulates TACs with a risk-based approach that uses an HRA to determine which sources and which pollutants to control as well as the degree of control. An HRA is an analysis in which human exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances in order to provide a quantitative estimate of health risks.[9] As part of ongoing efforts to identify and assess potential health risks to the public, BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area.

Monitoring data and emissions inventories of TACs help BAAQMD determine health risks to Bay Area residents. Ambient monitoring concentrations of TACs indicate that pollutants emitted primarily from motor vehicles (1,3-butadiene and benzene) account for a substantial portion of the ambient background

[8] California Air Resources Board. 2000. *Fact Sheet-California's Plan to Reduce Diesel Particulate Matter Emissions*. October. Available: https://ww3.arb.ca.gov/diesel/factsheets/rrpfactsheet.pdf. Accessed: March 15, 2022.

[9] In general, a health risk assessment is required if BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggests a potential public health risk. Such an assessment generally evaluates chronic, long-term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

risk in the Bay Area.[10] According to BAAQMD, ambient benzene levels declined dramatically in 1996 with the advent of reformulated Phase 2 gasoline. Because of this reduction, the calculated average cancer risk, based on monitoring results, has also been reduced.

Unlike TACs emitted from industrial and other stationary sources, most diesel particulate matter (DPM) is emitted from mobile sources, primarily diesel-powered construction and mining equipment, agricultural equipment, truck-mounted refrigeration units, and trucks and buses traveling on freeways and local roadways. Agricultural and mining equipment is not commonly used in the urban parts of the Bay Area, and construction equipment typically operates at various locations for only a limited time. As a result, the readily identifiable locations where DPM is emitted in the Bay Area include high-traffic roadways and other areas with substantial truck traffic. CARB estimated that about 70 percent of the total known cancer related to air toxics is attributable to DPM.[11] Within the Bay Area, BAAQMD found that, of all controlled TACs, emissions of DPM are responsible for about 82 percent of the total ambient cancer risk.[12]

CARB's Diesel Risk Reduction Plan is intended to reduce DPM emissions and associated health risks substantially through the introduction of ultra-low-sulfur diesel fuel, a step that has already been implemented, and cleaner diesel engines.[13] The technology for reducing DPM emissions from heavy-duty trucks is well established, and both state and federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions. CARB's plan also established airborne toxic control measures (ATCMs) for mobile sources, including on-road and off-road vehicles, and stationary sources. With implementation of ATCMs, statewide DPM concentrations decreased from approximately 1.8 $\mu g/m^3$ to approximately 0.61 $\mu g/m^3$ between 1990 and 2012, resulting in a 66 percent reduction over that period.[14] CARB continues to explore strategies to reduce DPM emissions through engine retrofits, cleaner diesel fuel, advanced engine technologies, and alternative fuels. By 2035, CARB estimates that DPM emissions will be less than half of what they were in 2010.[15]

High-Volume Roadways. Air pollutant exposures and their associated health burdens vary considerably at particular locations in relation to the sources of the air pollutants. Motor vehicle traffic is perhaps the most important source of air pollution in urban areas. Air quality research consistently demonstrates that pollutant levels are substantially higher near freeways and busy roadways, and human health studies have consistently demonstrated that children living within 100 to 200 meters (328 to 656 feet) of freeways or busy roadways have reduced lung function and higher rates of respiratory disease.[16] At present, it is not possible to attribute the effects of roadway proximity on non-cancer health effects to one or more specific vehicle type or vehicle pollutant. Engine exhaust from diesel, gasoline, and other combustion engines is a complex mixture of particles and gases with collective and individual toxicological characteristics.

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[10] Bay Area Air Quality Management District. 2017. *California Environmental Quality Act, Air Quality Guidelines*. May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: March 15, 2022.

[11] California Air Resources Board. 2021. *Overview: Diesel Exhaust and Health*. Available: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health. Accessed: March 15, 2022.

[12] Bay Area Air Quality Management District. 2017. *Final 2017 Clean Air Plan*. April. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: March 15, 2022.

[13] California Air Resources Board. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* Available: https://ww2.arb.ca.gov/sites/default/files/classic//diesel/documents/rrpfinal.pdf. Accessed: March 15, 2022.

[14] California Air Resources Board. 2021. *Overview: Diesel Exhaust and Health*. Available: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health. Accessed: March 15, 2022.

[15] Ibid.

[16] California Air Resources Board. *Air Quality and Land Use Handbook: A Community Health Perspective*. April. Available: https://ww3.arb.ca.gov/ch/handbook.pdf. Accessed: March 15, 2022.

Odors

Although offensive odors rarely cause physical harm, they can be unpleasant and lead to considerable distress among the public. This distress often generates citizen complaints to local governments and air districts. According to BAAQMD's California Environmental Quality Act (CEQA) Guidelines and CARB's *Air Quality and Land Use Handbook*, land uses associated with odor complaints typically include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, chemical plants, petroleum refineries, auto body shops, coating operations, fiberglass manufacturing plants, foundries, rendering plants, and livestock operations. BAAQMD provides recommended screening distances for citing new receptors near existing odor sources.

Existing Air Quality Conditions

CARB and the EPA (and BAAQMD in the Bay Area) maintain ambient air quality monitoring stations in California. The air quality monitoring station closest to the Project Site is the 897 Barron Avenue station in Redwood City, operated by BAAQMD, which is 2.9 miles to the west; it monitors criteria air pollutants. The air quality trends from this station are used to represent ambient air quality in the Project area. Ambient air quality in the Project area from 2018 to 2020 (the most recent available period) is shown in Table 3.4-2. The pollutants monitored at the Redwood City station are O_3, CO, NO_2, and $PM_{2.5}$. Air quality trends for PM_{10} are not monitored in San Mateo County; therefore, air quality trends for PM_{10} are from the 158 Jackson Street monitoring station in San José, operated by BAAQMD, 16.7 miles southeast of the Project Site.

Table 3.4-2. BAAQMD Monitoring Station Ambient Air Quality Data for the Project Area (2018–2020)

Pollutant Standards	2018	2019	2020
Ozone (O_3) at Redwood City station			
Maximum 1-hour concentration (ppm)	0.067	0.083	0.098
Maximum 8-hour concentration (ppm)	0.049	0.077	0.077
Fourth highest 8-hour concentration (ppm)	0.048	0.054	0.054
Number of days standard exceeded			
CAAQS 1-hour standard (> 0.09 ppm)	0	0	1
CAAQS 8-hour standard (> 0.070 ppm)	0	2	1
NAAQS 8-hour standard (> 0.070 ppm)	0	2	1
Carbon Monoxide (CO) at Redwood City station			
Maximum 8-hour concentration (ppm)	1.7	1.1	1.5
Maximum 1-hour concentration (ppm)	2.5	2.0	2.1
Number of days standard exceeded			
NAAQS 8-hour standard (≥ 9 ppm)	0	0	0
CAAQS 8-hour standard (≥ 9.0 ppm)	0	0	0
NAAQS 1-hour standard (> 35 ppm)	0	0	0
CAAQS 1-hour standard (≥ 20 ppm)	0	0	0
Nitrogen Dioxide (NO_2) from Redwood City station			
Maximum state 1-hour concentration (ppm)	0.077	0.054	0.045
Annual average concentration (ppm)	0.010	0.009	0.008
Number of days standard exceeded			
CAAQS 1-hour standard (0.18 ppm)	0	0	0
NAAQS 1-hour standard (0.100 ppm)	0	0	0

Pollutant Standards	2018	2019	2020
Particulate Matter (PM_{10}) at Jackson Street station			
Maximum state 24-hour concentration (μg/m³)	121.8	77.1	137.1
Maximum national 24-hour concentration (μg/m³)	115.4	75.4	134.9
National annual average concentration	20.9	18.4	29.9
Measured number of days standard exceeded			
CAAQS 24-hour standard (50 μg/m³)	4	4	10
NAAQS 24-hour standard (150 μg/m³)	0	0	0
Particulate Matter ($PM_{2.5}$) at Redwood City station			
Maximum state 24-hour concentration (μg/m³)	120.9	29.5	124.1
Maximum national 24-hour concentration (μg/m³)	120.9	29.5	124.1
National annual average concentration	10.5	7.0	9.8
Measured number of days standard exceeded			
NAAQS 24-hour standard (> 35 μg/m³)	13	0	9

Sources:
California Air Resources Board. 2021. *iADAM: Air Quality Data Statistics.* Top 4 Summary. Available: https://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed: November 2021.
U.S. Environmental Protection Agency. 2021. *Monitor Values Report*. Available: https://www.epa.gov/outdoor-air-quality-data/monitor-values-baareport. Accessed: November 2021.
Notes:
NAAQS = National Ambient Air Quality Standard; CAAQS = California Ambient Air Quality Standard; ppm = parts per million; μg/m³ = micrograms per cubic meter
An exceedance is not necessarily a violation.
State statistics are based on local conditions data; state statistics are based on California-approved samplers.
National statistics are based on standard conditions data. In addition, national statistics are based on samplers, using federal reference or equivalent methods.
State criteria for ensuring data are adequate for calculating valid annual averages are more stringent than national criteria.

Monitoring was also performed throughout the neighboring Belle Haven community to compare localized concentrations to concentrations at the nearest BAAQMD monitoring stations to determine if the regulatory monitoring stations are representative of concentrations experienced in the Belle Haven community. Air monitors similar to monitors used at the BAAQMD monitoring station were deployed to four locations within the Belle Haven community from October 8, 2020 through October 8, 2021. Concentrations of PM_{10}, $PM_{2.5}$, and air toxics from metals and VOCs were monitored at these locations. During the monitoring period, there were no exceedances of $PM_{2.5}$ NAAQS/CAAQS and no exceedances of the PM_{10} NAAQS at the Belle Haven monitors. There was one exceedance of the PM_{10} CAAQS, which is not unusual as the San Francisco air basin is in nonattainment for PM_{10}. Concentrations of particulate matter and air toxics in the Belle Haven community were generally found to be similar to concentrations reported by the nearest BAAQMD monitoring stations, which suggests that the BAAQMD monitoring stations are a reasonable estimate for air quality in the Belle Haven community. This additional monitoring was undertaken for background purposes and is not a requirement under CEQA for a project-level air quality analysis. The data are helpful for decision-makers and the public and included here for reference. For purposes of CEQA, the BAAQMD ambient air quality monitoring stations mentioned above are used in the analysis, where appropriate. See Appendix 3.4-4 for the local air quality monitoring report.

Existing TAC Sources and Health Risks

BAAQMD maintains an inventory of health risks associated with all permitted stationary sources within the SFBAAB. The inventory was last updated in 2020 and is publicly available online.[17] Within 1,000 feet of the Project Site there are six permitted facilities that have a quantified background health risk associated with them. Detailed information on these facilities is included in Appendix 3.4-1. Aside from stationary sources, emissions of TACs around the Project Site are also generated from mobile sources and railways. BAAQMD considers roadways with an average daily traffic (ADT) level of more than 10,000 to be "high-volume roadways" and recommends they be included in the analysis of health risks.

Regional Attainment Status

Local monitoring data are used to designate areas as nonattainment, maintenance, attainment, or unclassified areas for ambient air quality standards. The four designations are defined below. Table 3.4-3 summarizes the attainment status of San Mateo County.

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

Table 3.4-3. Federal and State Attainment Status for San Mateo County Portion of the SFBAAB

Criteria Pollutant	Federal Designation	State Designation
Ozone (8-hour)	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Unclassified/Attainment	Attainment
Particulate Matter (PM_{10})	Unclassified	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Attainment	Nonattainment
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Attainment
Sulfur Dioxide (SO_2)	Unclassified/Attainment	Attainment
Lead	Unclassified/Attainment	Attainment
Sulfates	(No Federal Standard)	Attainment
Hydrogen Sulfide	(No Federal Standard)	Unclassified
Visibility-Reducing Particles	(No Federal Standard)	Unclassified

Source:
California Air Resources Board. 2020. *State Area Designations Regulations*. Appendix C: Maps and Tables of Area Designations for State and National Ambient Air Quality Standards. October. Available: https://ww3.arb.ca.gov/ regact/2021/sad20/appc.pdf. Accessed: November 2, 2021.

[17] Bay Area Air Quality Management District. 2020. *Permitted Stationary Sources Risks and Hazards*. Available: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65. Accessed: March 15, 2022.

Sensitive Receptors

Sensitive land uses are generally considered to include those land uses where exposure to pollutants could result in health-related risks to sensitive individuals, including children and the elderly. Per BAAQMD, typical sensitive land uses include residences, hospitals, health clinics, and schools. Parks and playgrounds where sensitive receptors (e.g., children and seniors) are present are also considered sensitive land uses.[18] Places of employment (e.g., commercial/industrial uses) are not considered sensitive land uses because health-sensitive individuals (e.g., children and seniors) are not present.

Sensitive receptors located near the Project Site include both onsite and offsite sensitive receptor populations. Residential and recreational receptors were identified using zoning maps for Menlo Park (City of Menlo Park 2019) and East Palo Alto (City of East Palo Alto 2017). Residential and recreational areas were modeled as a grid with 20 meters (65.6 feet) spacing within 500 meters of the Project Site and 40 meters spacing within 1,000 meters of the Project Site. Other sensitive receptor locations were identified using a report from Environmental Data Resources (EDR). The EDR report identified schools, daycare centers, nursing homes and hospitals near the Project Site. The existing onsite Dialysis Center, which would continue operating on the Project Site during construction, was also included as a sensitive receptor. These locations were modeled as discrete locations. Figure 2 from the AQTR in Appendix 3.4-1 includes a map of both the offsite and onsite sensitive receptor locations that were modeled in the HRA. Figure 1 in Appendix 3.4-3 includes the locations for health clinics.

Regulatory Setting

The federal Clean Air Act (CAA) and its subsequent amendments form the basis for the nation's air pollution control effort. The EPA is responsible for implementing most aspects of the CAA. The NAAQS for criteria pollutants are a key element of the CAA, which delegates enforcement of the NAAQS to the states. In California, CARB is responsible for enforcing air pollution regulations and ensuring that the NAAQS and CAAQS are met. CARB, in turn, delegates regulatory authority for stationary sources and other air quality management responsibilities to local air agencies. BAAQMD is the local air agency for the Project area.

The following sections provide more detailed information on federal, state, and local air quality regulations that apply to the Proposed Project.

Federal

Clean Air Act and National Ambient Air Quality Standards

The federal CAA was enacted in 1963 and amended numerous times in subsequent years (1965, 1967, 1970, 1977, and 1990). The federal CAA establishes federal air quality standards, known as NAAQS, and specifies future dates for achieving compliance. The federal CAA also requires each state to submit and implement a State Implementation Plan (SIP) for local areas that fail to meet the standards. The plan must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the federal CAA identify specific emission reduction goals for areas that fail to meet the NAAQS. These amendments require both a demonstration of reasonable progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. The sections of the federal CAA that would affect development of the Proposed Project include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

[18] Bay Area Air Quality Management District. 2017. *California Environmental Quality Act, Air Quality Guidelines*. May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: March 15, 2022.

Table 3.4-4 shows the NAAQS that are currently in effect for each criteria pollutant. The CAAQS (discussed below) are provided for reference.

Table 3.4-4. Federal and State Ambient Air Quality Standards

Criteria Pollutant	Average Time	California Standards	National Standards[a]	
			Primary	Secondary
Ozone	1 hour	0.09 ppm	None[b]	None[b]
	8 hours	0.070 ppm	0.070 ppm	0.070 ppm
Particulate Matter (PM_{10})	24 hours	50 μg/m³	150 μg/m³	150 μg/m³
	Annual mean	20 μg/m³	None	None
Fine Particulate Matter ($PM_{2.5}$)	24 hours	None	35 μg/m³	35 μg/m³
	Annual mean	12 μg/m³	12.0 μg/m³	15.0 μg/m³
Carbon Monoxide	8 hours	9.0 ppm	9 ppm	None
	1 hour	20 ppm	35 ppm	None
Nitrogen Dioxide	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1 hour	0.18 ppm	0.100 ppm	None
Sulfur Dioxide[c]	Annual mean	None	0.030 ppm	None
	24 hours	0.04 ppm	0.14 ppm	None
	3 hours	None	None	0.5 ppm
	1 hour	0.25 ppm	0.075 ppm	None
Lead	30-day average	1.5 μg/m³	None	None
	Calendar quarter	None	1.5 μg/m³	1.5 μg/m³
	3-month average	None	0.15 μg/m³	0.15 μg/m³
Sulfates	24 hours	25 μg/m³	None	None
Visibility-Reducing Particles	8 hours	—[d]	None	None
Hydrogen Sulfide	1 hour	0.03 ppm	None	None
Vinyl Chloride	24 hours	0.01 ppm	None	None

Source: California Air Resources Board. 2016. *Ambient Air Quality Standards*. Available: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf. Accessed: November 2, 2021.

Notes:

PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less

$PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less

μg/m³ = micrograms per cubic meter

ppm = parts per million

a. National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

b. The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for SIPs.

c. The annual and 24-hour NAAQS for sulfur dioxide apply for only 1 year after designation of the new 1-hour standard in areas that were previously nonattainment areas for the 24-hour and annual NAAQS.

d. The CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer (visibility of 10 miles or more due to particles when relative humidity is less than 70 percent).

Non-Road Diesel Rule

The EPA has established a series of increasingly strict emissions standards for new off-road diesel equipment, on-road diesel trucks, and locomotives. New construction equipment used for the Proposed Project, including heavy-duty trucks and off-road construction equipment, would be required to comply with the emissions standards.

Corporate Average Fuel Economy Standards

The National Highway Traffic Safety Administration (NHTSA) Corporate Average Fuel Economy (CAFE) standards require substantial improvements in fuel economy and reductions in emissions of criteria air pollutants and precursors, as well as greenhouse gases, from all light-duty vehicles sold in the United States. On August 2, 2018, NHTSA and the EPA proposed an amendment to the fuel efficiency standards for passenger cars and light trucks and established new standards for model years 2021 through 2026 that would maintain the then-current 2020 standards through 2026—this was known as the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule. On September 19, 2019, NHTSA and the EPA issued a final action on the One National Program Rule, which is considered Part One of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards. The One National Program Rule enables NHTSA and the EPA to provide nationwide uniform fuel economy and air pollutant standards by 1)clarifying that federal law preempts state and local tailpipe standards, 2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and 3) withdrawing California's CAA preemption waiver to set state-specific standards.

NHTSA and the EPA published their decision to withdraw California's waiver and finalize the regulatory text related to the preemption on September 27, 2019 (84 *Federal Register* 51310). California, 22 other states, the District of Columbia, and two cities filed suit against Part One of the SAFE Vehicles Rule on September 20, 2019 (*California et al. v. United States Department of Transportation et al.,* 1:19-cv-02826, U.S. District Court for the District of Columbia). On October 28, 2019, the Union of Concerned Scientists, Environmental Defense Fund, and other groups filed a protective petition for review after the federal government sought to transfer the suit to the District of Columbia (*Union of Concerned Scientists v. National Highway Traffic Safety Administration*). The lawsuit filed by California and others has been stayed, pending resolution of the petition.

NHTSA and the EPA published final rules on April 30, 2020, to amend and establish national air pollutant and fuel economy standards (Part Two of the SAFE Vehicles Rule) (85 *Federal Register* 24174). The revised rule changes the national fuel economy standards for light-duty vehicles from 46.7 miles per gallon (mpg) to 40.4 mpg in future years. California, 22 other states, and the District of Columbia filed a petition for review of the final rule on May 27, 2020.[19]

On January 20, 2021, President Biden issued an executive order, directing NHTSA and the EPA to review the SAFE Vehicles Rule, Part One, and propose a new rule for suspending, revising, or rescinding it by April 2021. The executive order also requires NHTSA and the EPA to propose a new rule for suspending, revising, or rescinding Part Two by July 2021. On April 22, 2021, NHTSA announced that it proposes to repeal the SAFE Vehicles Rule, Part One, allowing California the right to set its own standards.[20] On

[19] *California et al. v. United States Department of Transportation et al.*, 1:19-cv-02826, U.S. District Court for the District of Columbia.

[20] U.S. Department of Transportation, National Highway Transportation Safety Administration. 2021. *Corporate Average Fuel Economy Preemption.* Available: https://www.federalregister.gov/documents/2021/05/12/2021-08758/corporate-average-fuel-economy-cafe-preemption. Accessed: November 2, 2021.

December 21, 2021, NHTSA published its CAFE Preemption Rule, which repeals 2019's SAFE Vehicles Rule, Part One: One National Program. That rule had codified preemption of state and local laws related to fuel economy standards. NHTSA's 2021 rule thus reopens pathways for state and local fuel economy laws.

State

California Clean Air Act and California Ambient Air Quality Standards

In 1988, the state legislature adopted the California CAA, which established a statewide air pollution control program. The California CAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the California CAA does not set precise attainment deadlines. Instead, the California CAA establishes increasingly stringent requirements for areas that require more time to achieve the standards. The CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. The CAAQS and NAAQS are listed together in Table 3.4-4.

CARB and local air districts bear responsibility for achieving California's air quality standards. The standards are to be achieved through district-level air quality management plans, which are incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB has traditionally established state air quality standards, maintained oversight authority for air quality planning, developed programs for reducing emissions from motor vehicles, developed air emissions inventories, collected air quality and meteorological data, and approved SIPs.

The California CAA substantially increases the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The California CAA also emphasizes control of "indirect and area-wide sources" of air pollutant emissions. The California CAA gives local air pollution control districts explicit authority to regulate indirect sources and establish traffic control measures. BAAQMD is the primary agency responsible for ensuring that the NAAQS and CAAQS are attained and maintained in the Bay Area. BAAQMD's thresholds of significance are generally designed to support attainment and maintenance of the NAAQS and CAAQS.

Statewide Truck and Bus Regulation

CARB adopted the Truck and Bus Regulation in 2008 to focus its efforts on reducing emissions of DPM, NO_X, and other criteria pollutants from diesel-fueled vehicles. This regulation applies to any diesel-fueled vehicle as well as any dual-fuel or alternative-fuel diesel vehicle that travels on public highways; yard trucks with on-road engines; yard trucks with off-road engines used for agricultural operations; school buses; and vehicles with a gross vehicle weight rating (GVWR) of more than 14,000 pounds. The purpose of the regulation is to require trucks and buses registered in the state to have 2010 or newer engines by 2023. Compliance schedules have been established for lighter vehicles (GVWR of 14,000–26,000 pounds) and heavier vehicles (GVWR of more than 26,001 pounds).[21] As of January 1, 2020, only vehicles that met the requirements of the Trucks and Bus Regulation were allowed to register with the California Department of Motor Vehicles.

[21] California Air Resources Board. 2020. *CARB Truck Rule Compliance Required for DMV Registration*. July. Available: https://ww3.arb.ca.gov/msprog/truckstop/pdfs/sb1_faqeng.pdf. Accessed: March 15, 2022.

Air Toxic Control Measure

In 2004, CARB developed multiple measures under its Air Toxic Control Measure (ATCM) to address specific mobile- and stationary-source issues that have an impact on public health. The ATCMs focused on reducing the public's exposure to DPM and TAC emissions. The "Limit Diesel-Fueled Commercial Motor Vehicle Idling" ATCM required drivers of heavy-duty trucks with a GVWR of more than 10,000 pounds to not idle the primary engine for more than 5 minutes at any given time or operate an auxiliary power system for more than 5 minutes within 100 feet of a restricted area.[22] In addition, CARB set operating requirements for new emergency standby engines (i.e., diesel-fueled compression-ignition engines of less than 50 brake horsepower). Specifically, new engines shall not operate more than 50 hours per year for maintenance and testing purposes. This does not limit engine operation for emergency use or emission testing required to show compliance with ATCM Section 93115.6(a)(3).

Toxic Air Contaminant Regulation

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 ('Hot Spots' Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce the public's exposure to air toxics. The "Hot Spots" Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification for people who were exposed to a significant health risk, and facility plans to reduce risks.

In August 1998, CARB identified DPM from diesel-fueled engines as a TAC. In September 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. As discussed previously, implementation of ATCMs helped reduce statewide DPM concentrations substantially. CARB plans to continue its efforts to reduce DPM emissions and estimates that, by 2035, DPM emissions will be less than half of what they were in 2010.[23]

Off-Road Diesel Vehicle Regulation

Off-road vehicles include, but are not limited to, diesel compression-ignition equipment; spark-ignition gasoline and liquified petroleum gas equipment; support equipment at ports, airports, and railways; and marine vehicles. In 2007, CARB aimed to reduce emissions of DPM, NO_X, and other criteria pollutants from off-road diesel-fueled equipment with adoption of the In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation). The Off-Road Regulation applies to all diesel-fueled equipment or alternative-fuel diesel equipment with a compression-ignition engine greater than 25 horsepower (e.g., tractors, bulldozers, backhoes) as well as dual-fuel equipment. The regulation also applies to all equipment that is rented or leased.[24] The purpose of the regulation is to reduce emissions by retiring, repowering, or replacing older, dirtier engines with newer, cleaner engines. The regulation established a compliance schedule for owners of small, medium, and large fleets. The schedule for large and medium fleets requires full implementation by 2023; small fleets have until 2028.[25]

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[22] California Air Resources Board. 2005. *Final Regulation Order, Regulation for In-Use Off-Road Diesel Vehicles.* Available: https://ww3.arb.ca.gov/regact/2007/ordiesl07/frooal.pdf. Accessed March 15, 2022.

[23] California Air Resources Board. 2021. *Overview: Diesel Exhaust and Health*. Available: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health. Accessed: March 15, 2022.

[24] California Air Resources Board. 2008. *Final Regulation Order, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.* Available: https://ww3.arb.ca.gov/regact/idling/fro1.pdf. Accessed: March 15, 2022.

[25] Ibid.

Local

Bay Area Air Quality Management District

BAAQMD seeks to attain and maintain air quality conditions in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. Its clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations, as required by law.

2017 Bay Area Clean Air Plan

The 2017 Bay Area Clean Air Plan (Clean Air Plan) guides the region's air quality planning efforts to attain the CAAQS.[26] The current plan, adopted on April 19, 2017, by the BAAQMD Board of Directors, contains district-wide control measures to reduce O_3 precursor emissions (e.g., ROGs and NO_X), particulate matter, and greenhouse gas (GHG) emissions. Specifically, the Clean Air Plan:

- Describes the BAAQMD plan for attaining all state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities;
- Defines a vision for transitioning the region to the post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050;
- Provides a regional climate protection strategy that will put the Bay Area on a pathway to achieving GHG reduction targets; and
- Includes a wide range of control measures to decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as particulate matter, O_3, and TACs; reduce emissions of methane and other GHGs with high global warming potential that are potent climate pollutants in the near term; and decrease emissions of CO by reducing fossil fuel combustion.

BAAQMD CARE Program

The Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources, area sources, and on-road and off-road mobile sources, with an emphasis on diesel exhaust, which is a major contributor to airborne health risks in California. The CARE program is an ongoing program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases: an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TACs, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and a high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area.

For commercial and industrial sources, BAAQMD regulates TACs using a risk-based approach. This approach uses an HRA to determine what sources and pollutants to control as well as the degree of

[26] Bay Area Air Quality Management District. 2017. *Final 2017 Clean Air Plan*. April. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: March 15, 2022.

control. An HRA is an analysis in which human health exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances in order to provide a quantitative estimate of health risks.[27] As part of ongoing efforts to identify and assess potential health risks to the public, BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. BAAQMD has identified seven affected communities; Menlo Park has not been identified as an affected community.[28,29]

BAAQMD CEQA Air Quality Guidelines

The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of the air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics, odors, and GHG emissions.

In June 2010, BAAQMD adopted updated CEQA Air Quality Guidelines and finalized them in May 2011. The guidelines, which superseded the previously adopted agency air quality guidelines of 1999, were intended to advise lead agencies on how to evaluate potential air quality impacts. In May 2017, BAAQMD published an updated version of the CEQA Air Quality Guidelines. The 2017 CEQA Air Quality Guidelines included thresholds for evaluating a project's impact on air quality. These protective thresholds are applicable to the size, scale, and location of the Proposed Project.

City of Menlo Park

The City General Plan consists of the Open Space/Conservation, Noise, and Safety Elements, adopted May 21, 2013; the 2015–2023 Housing Element, adopted by the City on April 1, 2014; and the Circulation and Land Use Elements, adopted November 29, 2016. The following policies from the Open Space and Conservation Element were adopted to avoid or minimize environmental impacts and pertain to the Proposed Project:

Goal OSC5: Ensure healthy air and water quality.

> **Policy OSC5.1: Air and Water Quality Standards.** Continue to apply standards and policies established by BAAQMD, the San Mateo Countywide Water Pollution Prevention Program, and City of Menlo Park Climate Action Plan through the CEQA process and other means as applicable.

The following policies from the Circulation Element were adopted to avoid or minimize environmental impacts and pertain to the Proposed Project:

Goal OSC4: Improve Menlo Park's overall health, wellness, and quality of life through transportation enhancements.

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[27] In general, a health risk assessment is required if BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggests a potential public health risk. Such an assessment generally evaluates chronic, long-term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

[28] The affected communities are Richmond/San Pablo; eastern San Francisco, including Treasure Island; San José; western Alameda County; Concord, Vallejo; and Pittsburg/Antioch.

[29] Bay Area Air Quality Management District. 2015. *Identifying Areas with Cumulative Impacts from Air Pollution in the San Francisco Bay Area*. March. Available: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Documents/ImpactCommunities_2_Methodology.ashx. Accessed: March 15, 2022.

Policy CIRC-4.2: Local Air Pollution. Promote non-motorized transportation to reduce exposure to local air pollution, thereby reducing risks of respiratory diseases, other chronic illnesses, and premature death.

Environmental Impacts

This section describes the impact analysis related to air quality for the Proposed Project. It describes the methods used to determine the impacts of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as necessary.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Project would be considered to have a significant effect if it would result in any of the conditions listed below.

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

The sections that follow discuss thresholds and analysis considerations for regional and local Project-generated criteria pollutants with respect to their human health implications as well as a discussion regarding potential odor emissions from the Proposed Project.

Local Air District Thresholds

Regional Thresholds for Air Basin Attainment of State and Federal Ambient Air Quality Standards

BAAQMD has adopted thresholds for regional air pollutants to assist lead agencies in determining the significance of environmental effects with respect to local attainment of state and federal ambient air quality standards. (As discussed above, ROG and NO_X are regional pollutants, whereas particulate matter is both a regional and local pollutant.) The thresholds are based on emissions levels identified under the New Source Review (NSR) program, which is a permitting program established by Congress as part of the CAA amendments of 1990 to ensure that air quality is not significantly degraded (i.e., under a worsened nonattainment status) by new sources of emissions. The NSR program requires stationary sources to receive permits before construction and/or the use of equipment. By permitting large stationary sources, the NSR program ensures that new emissions will not slow regional progress toward attaining the NAAQS. BAAQMD concluded that the stationary pollutants described under the NSR program are equal in significance to those generated with land use projects.

BAAQMD's regional thresholds identified in Table 3.4-5 were set as the total emission thresholds associated within the NSR program to help attain the NAAQS.[30]

[30] Bay Area Air Quality Management District. 2017. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: March 15, 2022.

Table 3.4-5. BAAQMD Project-Level Regional Criteria Pollutant Emission Thresholds

Analysis	Thresholds
Regional Criteria Pollutants (Construction)	• Reactive Organic Gases: 54 pounds/day • Nitrogen Oxides: 54 pounds/day • Particulate Matter: 82 pounds/day (exhaust only); compliance with best management practices (fugitive dust) • Fine Particulate Matter: 54 pounds/day (exhaust only); compliance with best management practices (fugitive dust)
Regional Criteria Pollutants (Operations)	• Reactive Organic Gases: 54 pounds/day • Nitrogen Oxides: 54 pounds/day • Particulate Matter: 82 pounds/day (exhaust + fugitive dust) • Fine Particulate Matter: 54 pounds/day (exhaust + fugitive dust)

Source: Bay Area Air Quality Management District. 2017. *California Environmental Quality Act, Air Quality Guidelines*. May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: November 2, 2021.

Health-Based Thresholds for Regional Project-Generated Criteria Pollutants of Human Health Concern

The California Supreme Court's 2018 decision in *Sierra Club v. County of Fresno* (6 Cal. 5th 502), hereafter referred to as the Friant Ranch Decision, included review of the long-term regional air quality analysis contained in the EIR for the proposed Community Plan Update and Friant Ranch Specific Plan (Friant Ranch Project). The Friant Ranch Project proposed a 942-acre master-plan development in unincorporated Fresno County, within the San Joaquin Valley Air Basin, which is currently designated as a nonattainment area with respect to the NAAQS and CAAQS for O_3 and $PM_{2.5}$. The court found that the EIR's air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." The court's decision notes that environmental documents must attempt to connect a project's air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis.

All criteria pollutants generated by the Proposed Project would be associated with some form of health risk (e.g., asthma, lower respiratory problems). Criteria pollutants can be classified as either regional pollutants or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. O_3 is considered a regional criteria pollutant, whereas CO, NO_2, SO_2, and lead are localized pollutants. Particulate matter can be both a local and a regional pollutant, depending on its composition. The primary criteria pollutants of concern generated by the Proposed Project would be O_3 precursors (ROG and NO_X), CO, and particulate matter, including DPM.

The sections that follow discuss thresholds and analysis considerations for regional and local Project-generated criteria pollutants with respect to their human health implications.

Regional Project-Generated Criteria Pollutants (Ozone Precursors and Regional Particulate Matter)

Adverse health effects from regional criteria pollutant emissions, such as O_3 precursors and particulate matter, generated by the Proposed Project are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). Therefore, O_3 precursors (ROG and NO_X) contribute

to the formation of ground-level O_3 on a regional scale. Emissions of ROG and NO_X generated in an area may not correlate to a specific O_3 concentration in that same area. Similarly, some types of particulate pollutant may be transported over long distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased O_3 or regional particulate matter concentrations are the product of emissions generated by numerous sources throughout a region. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an adverse health effect. As discussed above, there are large individual differences in the intensity of symptomatic responses to air pollutants. These differences are influenced, in part, by the underlying health condition of an individual, which cannot be known.

Models and tools have been developed to correlate regional criteria pollutant emissions to potential community health impacts. Although models are capable of quantifying O_3 and any secondary particulate matter formation and associated health effects, these tools were developed to support large regional planning and policy analysis and have limited sensitivity to small changes in criteria pollutant concentrations induced by individual projects.

The technical limitations of existing models (e.g., for correlating Project-level regional emissions to specific health consequences) are recognized by air quality management districts throughout the state, including the San Joaquin Valley Air Pollution Control District (SJVAPCD) and South Coast Air Quality Management District (SCAQMD), which provided amici curiae briefs for the Friant Ranch Project's legal proceedings. In its brief, the SJVAPCD acknowledged that HRAs for localized air toxics, such as DPM, are common; however, the SJVAPCD stated that "it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task."[31] The SJVAPCD further noted that emissions solely from the Friant Ranch Project, which equated to less than one-tenth of one percent of total NO_X and volatile organic compounds in the valley, were not likely to yield valid information and that any such information would not be "accurate when applied at the local level." SCAQMD presents similar information in its brief, stating that "it takes a large amount of additional precursor emissions to cause a modeled increase in ambient O_3 levels."[32,33] As of February 2022, BAAQMD has not approved a quantitative method for accurately correlating criteria pollutant emissions generated by an individual project to specific health outcomes or changes in nonattainment days.

As discussed above, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations as well as attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates that there are known safe concentrations of criteria pollutants. Although recognizing that air quality is a cumulative problem, air districts typically consider projects that generate criteria pollutant and O_3 precursor emissions that are below the thresholds to be minor in nature. Such projects would not adversely affect air quality or exceed the NAAQS or CAAQS. Emissions generated by the Proposed Project could increase photochemical reactions and the formation of tropospheric O_3 and secondary particulate

[31] San Joaquin Valley Air Pollution Control District. 2015. *Amicus Curiae Brief of San Joaquin Valley Unified Air Pollution Control District in Support of Defendant and Respondent, County of Fresno and Real Party in Interest and Respondent, Friant Ranch, L.P.* Available: https://www.courts.ca.gov/documents/7-s219783-ac-san-joaquin-valley-unified-air-pollution-control-dist-041315.pdf. Accessed: March 15, 2022.

[32] South Coast Air Quality Management District. 2015. *Application of the South Coast Air Quality Management District for Leave to File Brief of Amicus Curiae in Support of Neither Party and [Proposed] Brief of Amicus Curiae.* Available: https://www.courts.ca.gov/documents/9-s219783-ac-south-coast-air-quality-mgt-dist-041315.pdf. Accessed: March 15, 2022.

[33] For example, SCAQMD's analysis of its 2012 Air Quality Attainment Plan showed that the modeled NO_x and ROG reductions of 432 and 187 tons per day, respectively, reduced ozone levels by only 9 parts per billion.

matter, which, at certain concentrations, could lead to increased incidences of specific health consequences. Although these health effects are associated with O_3 and particulate pollution, the effects are a result of cumulative and regional emissions. A qualitative correlation of Project-generated regional criteria pollutant emissions to specific human health impacts is included in this analysis, as described further under Impact AQ-3.

Localized Project-Generated Criteria Pollutant Emissions (CO and Particulate Matter) and Air Toxics (TACs and Asbestos)

Localized pollutants generated by a project can affect populations near the emissions source. Because these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. The localized pollutants of concern that would be generated by the Proposed Project are CO, particulate matter, DPM, asbestos, ethylbenzene, toluene, hexane, xylenes, benzene, styrene, 1,3-butadiene, acrolein, propylene, formaldehyde, methanol, acetaldehyde, methyl ethyl ketone, and naphthalene. The applicable thresholds for each pollutant are described below.

Localized Carbon Monoxide Concentrations

Heavy traffic congestion can contribute to high levels of CO, and individuals exposed to such hot spots may have a greater likelihood of developing adverse health effects. BAAQMD has adopted screening criteria that provide a conservative indication of whether Project-generated traffic would cause a potential CO hot spot. If the screening criteria are not met, a quantitative analysis through site-specific dispersion modeling of Project-related CO concentrations would not be necessary, and the Proposed Project would not cause localized violations of the CAAQS for CO. Projects that do not generate CO concentrations in excess of the health-based CAAQS would not contribute a significant level of CO such that localized air quality and human health would be substantially degraded. BAAQMD's CO screening criteria are summarized below.

1. Project traffic would not increase traffic volumes at affected intersections beyond 44,000 vehicles per hour.
2. Project traffic would not increase traffic volumes at affected intersections beyond 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., a tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).
3. The project would be consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, a regional transportation plan, and local congestion management agency plans.

Localized Particulate Matter Concentrations

BAAQMD adopted an incremental $PM_{2.5}$ concentration-based significance threshold in which a "substantial" contribution at the project level for an individual source is defined as total $PM_{2.5}$ concentrations (i.e., exhaust and fugitive) exceeding 0.3 $\mu g/m^3$. This is the same threshold used to evaluate the placement of new receptors that would be exposed to individual $PM_{2.5}$ emissions sources. In addition, BAAQMD considers projects to have a cumulatively considerable $PM_{2.5}$ impact if sensitive receptors are exposed to $PM_{2.5}$ concentrations from local sources within 1,000 feet, including existing sources, project-related sources, and reasonably foreseeable future sources, that exceed 0.8 $\mu g/m^3$.

BAAQMD has not established PM_{10} thresholds of significance. BAAQMD's $PM_{2.5}$ thresholds apply to new sources. However, BAAQMD considers fugitive PM_{10} from earthmoving activities to be less than significant with application of BAAQMD's best management practices (BMPs).

Localized Toxic Air Contaminant Concentrations

DPM has been identified as a TAC. DPM is particularly concerning because long-term exposure can lead to cancer, birth defects, and damage to the brain and nervous system. Other common TACs are in the form of ethylbenzene, toluene, hexane, xylenes, benzene, styrene, 1,3-butadiene, acrolein, propylene, formaldehyde, methanol, acetaldehyde, methyl ethyl ketone, and naphthalene. BAAQMD has adopted incremental cancer and hazard thresholds to evaluate receptor exposure to single sources of TAC emissions. The "substantial" TAC threshold, as defined by BAAQMD, is exposure of a sensitive receptor to an individual emissions source that results in an excess cancer risk level of more than 10 in 1 million or a non-cancer (i.e., chronic or acute) hazard index (HI) greater than 1.0.

The air district considers projects to have a cumulatively considerable TAC impact if they contribute TAC emissions that, when combined with cumulative sources within 1,000 feet of sensitive receptors, result in excess cancer risk levels of more than 100 in 1 million or an HI greater than 10.0. BAAQMD considers a project to have a significant cumulative impact if it introduces new receptors at a location where the combined exposure to all cumulative sources within 1,000 feet is in excess of the cumulative thresholds.

Asbestos

BAAQMD considers a project to have a significant impact if it does not comply with the applicable regulatory requirements outlined in Regulation 11, Rule 2, Asbestos Demolition, Renovation, and Manufacturing.

Methods for Analysis

Air quality impacts associated with construction and operation of the Proposed Project were assessed and quantified using standard and accepted software tools, calculations, and emission factors. A summary of the methodology is provided below.

Construction

Construction of the Proposed Project is estimated to have a duration of approximately 5 years. This analysis assumes that construction phases at specific buildings will overlap (i.e., multiple buildings under construction simultaneously), that complete build out will occur in roughly 5 years, and that the buildings will be occupied and fully operational as soon as construction for each building is completed. This is conservative because occupancy and operation of each building would likely ramp up over time, rather than immediately upon completion of construction. The analysis also assumes that operational emissions from completed buildings would overlap with construction emissions from buildings that are still being constructed.

Construction would generate ROG, NO_X, PM_{10}, and $PM_{2.5}$ that could result in short-term air quality effects during the construction period. Emissions would be associated with exhaust from off-road equipment, exhaust from construction workers' vehicles and haul trucks, fugitive dust from site grading and earthmoving, suspended road dust from vehicle travel, and off-gassing emissions from architectural coatings and paving. The BAAQMD regional construction thresholds require evaluation of only exhaust

emissions; however, the air quality analysis also estimated fugitive dust emissions for the localized $PM_{2.5}$ analysis. Emissions were estimated using a combination of emission factors and methodologies from the California Emissions Estimator Model (CalEEMod), version 2020.4.0; CARB's EMission FACtor 2021 (EMFAC2021) model; and EPA's AP-42: Compilation of Air Pollutant Emission Factors. The estimates relied on a combination of CalEEMod default data values as well as Project-specific information (e.g., construction schedule, construction equipment types, hours of operation) provided by the Project Sponsor. A detailed description of model input and output parameters and assumptions is provided in Appendix 3.4-1.

Operation

Operation of the Proposed Project would generate emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ that could result in long-term air quality effects during the operations period. Criteria pollutant emissions from motor vehicles associated with development of the Proposed Project were evaluated using CalEEMod methodologies and emission factors from EMFAC2021, along with trip generation rates and trip lengths provided by the Hexagon Transportation Consultants for the Proposed Project based on information included as Appendix 3.3-1.[34] Area-, energy-, and stationary-source emissions associated with the Proposed Project were also estimated using CalEEMod methodologies and included in Appendix 3.4-1. Area-source emissions would result from the reapplication of architectural coatings as part of ongoing building maintenance, the use of consumer products, and the use of landscaping equipment. Energy-source emissions would result from indirect emissions from electricity used by buildings and the combustion of natural gas for culinary uses. Stationary-source emissions would result from the maintenance and testing of diesel-powered emergency generators that would conservatively be assumed to operate for 50 hours per year. The first operational phase of the Proposed Project is assumed to be in 2024; the Proposed Project would be fully operational by 2026.[35] A detailed description of model input and output parameters and assumptions is provided in Appendix 3.4-1.

Health Risk Analysis

An HRA was prepared to quantify the levels of exposure at nearby sensitive receptors from emissions of TACs and $PM_{2.5}$ generated during both Proposed Project construction and operation. The HRA is included in Appendix 3.4-1. A supplemental memo to the HRA addressing the on-site dialysis clinic is included in Appendix 3.4-3.

Toxic Air Contaminants and $PM_{2.5}$

The Proposed Project would generate DPM, $PM_{2.5}$, and TACs from gasoline combustion emissions during construction and operations. Because the Proposed Project would introduce TACs and $PM_{2.5}$ emissions in an area near existing sensitive receptors, an HRA was conducted. The HRA used EPA's most recent air dispersion model, AERMOD (version 21112); cancer and chronic risk assessment values for DPM provided by the Office of Environmental Health Hazard Assessment (OEHHA); and other assumptions for

[34] Hexagon Transportation Consultants, Inc. December 30, 2021. Facebook *Willow Campus Draft Transportation Impact Analysis*.

[35] Construction was conservatively assumed to begin in 2021. This is a conservative assumption from an air quality standpoint because fleet turnover, as it pertains to construction equipment, results in older, more polluting equipment being gradually replaced by cleaner, more efficient equipment.

model inputs recommended in BAAQMD's Health Risk Assessment Modeling Protocol.[36] The HRA applies the most recent guidance and calculation methods from OEHHA's *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments*.[37] The HRA consists of three parts: an emissions inventory, air dispersion modeling, and risk calculations. A description of each of these parts follows.

Emissions Inventory

The emissions inventory includes DPM and $PM_{2.5}$ emissions from construction and operations. During construction, DPM emissions would be generated by off-road equipment and on-road travel by heavy-duty trucks. The construction $PM_{2.5}$ inventory consists of $PM_{2.5}$ exhaust and fugitive dust emissions from off-road equipment, onsite soil movement, and on-road travel by heavy-duty trucks and workers' vehicles. The emissions of other TACs from workers' vehicles would be negligible compared to emissions of DPM; therefore, TACs from workers' vehicles were not included in the HRA.

The operational TAC inventory includes emissions from maintenance and testing of the thirteen emergency generators and on-road travel by vehicles. The operational $PM_{2.5}$ inventory consists of $PM_{2.5}$ exhaust emissions from the emergency generators and $PM_{2.5}$ exhaust and fugitive dust emissions from on-road travel by operational vehicles.

Air Dispersion Modeling

The HRA uses EPA's AERMOD model, version 21112, to model annual average DPM and $PM_{2.5}$ concentrations at nearby receptors. Modeling inputs, including emission rates in grams of pollutant emitted per second, and source characteristics (e.g., release height, stack diameter, plume width) were based on guidance provided by OEHHA, BAAQMD, and the SCAQMD. Meteorological data were obtained from CARB from the Palo Alto Airport (KPAO) and San Carlos Airport (KSQL). These meteorological stations are the nearest meteorological monitoring stations (2.2 miles southeast and 6 miles northwest of the Project Site, respectively, for KPAO and KSQL).

Construction

Onsite construction emissions from off-road equipment were characterized as polygon area sources that outlined the footprint of each section of the Project Site. A release height of 5.0 meters represented exhaust emissions, and a release height of 0 meters represented onsite fugitive dust emissions.[38] The release height represents the height above the ground at which pollutants are emitted. On-road travel emissions from haul and vendor trucks, as well as workers' vehicles for $PM_{2.5}$ analysis, were characterized as line sources with a release height of 2.55 meters. Feeder line equipment associated with the proposed offsite improvements was modeled as adjacent volume sources, with a release height of 5.0 meters.

To account for the plume rise associated with mechanically generated air turbulence from construction emissions for the AERMOD run, the initial vertical dimension of the area sources was modeled at 1.16 meters for exhaust. For the line sources, the initial vertical dimension was 2.37 meters. For volume

[36] Bay Area Air Quality Management District. 2020. *Health Risk Assessment Modeling Protocol*. December. Available: https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en. Accessed: March 15, 2022.

[37] Office of Environmental Health Hazard Assessment. 2015. *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments*. February. Available: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: March 15, 2022.

[38] South Coast Air Quality Management District. 2008. *Final Localized Significance Threshold Methodology*. Revised July. Available: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2. Accessed: March 15, 2022.

sources, the initial vertical dimensions were 1.16 meters for exhaust and 1.0 meters for fugitive dust. Plume rise is the height that pollutants rise above a release height. For exhaust, plume rise occurs because of the temperature of the exhaust gas. Exhaust gas temperatures can be high, which causes the plume to rise. For dust, plume rise accounts for the mechanical entrainment of dust in the wheels of equipment and trucks. Emissions from off-road equipment were assumed to be generated throughout the construction footprint. Emissions from offsite trucks were modeled along the road segments adjacent to the construction footprint.

The modeling of emissions from construction activities was based on the number of hours construction would be permitted to occur and the number of days (11 hours per day, 7 days per week). These assumptions were used to derive accurate averages; construction activities may not actually occur on this schedule. For further details regarding modeling assumptions refer to Appendix 3.4-1. The rural dispersion option was used in the analysis because of the Project Site's proximity to San Francisco Bay and marshland. Residential and recreational areas were modeled as a grid with 20 meters (65.6 feet) spacing within 500 meters of the Project Site and 40 meters spacing within 1,000 meters of the Project Site. Although not required by CEQA, this section describes health risks of the Project's users and residents during Project construction, as onsite residential land uses may be occupied during late-stage Project construction. The health impacts associated with Project construction and operation at onsite sensitive receptors were analyzed with a grid spacing of 10 meters over residential buildings and at multiple floor heights, ranging from 1.8 to 25.8 meters, with each floor assumed to be 3 meters. Other sensitive receptor locations were identified using a report from Environmental Data Resources (EDR). The EDR report identified schools, daycare centers, nursing homes and hospitals near the Project Site. The existing onsite Dialysis Center, which would be relocated into temporary trailers and remain onsite during construction, was also included as a sensitive receptor. These locations were modeled as discrete locations.[39]

Operations

Operations would generate TACs and $PM_{2.5}$ from vehicle travel and testing and maintenance of emergency generators. On-road traffic sources other than intercampus shuttles were characterized as line sources with a release height of 1.7 meters; intercampus shuttles were characterized as line sources with a release height of 3.39 meters. To account for plume rise associated with mechanically generated air turbulence from operational emissions sources for the AERMOD run, the initial vertical dimensions for the line sources was 1.58 meters for non-intercampus shuttles and 3.15 meters for intercampus shuttles. The emergency generators would generate both DPM and $PM_{2.5}$ emissions. The emergency generators were represented as point sources, with a release height assumed to be the height of the building at which they are located, exit temperature of 739.82 Kelvin, and exit velocity of 45.3 meters per second.[40][41]

[39] Bay Area Air Quality Management District. 2017. California Environmental Quality Act, Air Quality Guidelines. May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: March 15, 2022.

[40] The precise heights for the generators are not known at this time. Modeling the generators at the same level as the roof overestimates the results because of the way in which exhaust travels and where the sensitive receptors are located. In addition, before becoming operational, the generators would need to receive permits to operate from BAAQMD. Through this application process, the health impacts of these generators, with their final stack heights and locations, would be reviewed by BAAQMD to ensure that emissions would remain below thresholds.

[41] San Francisco Department of Public Health. 2020. *San Francisco Citywide Health Risk Assessment Technical Support* Document. February. Available: https://www.sfdph.org/dph/files/EHSdocs/AirQuality/Air_Pollutant_Exposure_Zone_Technical_Documentation_2020.pdf.

Similar to construction, the rural dispersion option was used. Sensitive receptors for operations were placed at the same locations as the construction analysis. Receptors were given a height of 1.8 meters to represent the average human breathing zone.[42] A complete list of dispersion modeling inputs is provided in Appendix 3.4-1.

Risk Calculations

The risk calculations incorporate OEHHA's age sensitivity factors, which account for increased sensitivity to carcinogens during early-in-life exposure. The approach for estimating cancer risk from long-term inhalation, including exposure to carcinogens, requires calculating a range of potential doses and multiplying by cancer potency factors in units corresponding to the inverse dose to obtain a range of cancer risks. For cancer risk, the risk for each age group is calculated using the appropriate daily breathing rates, age sensitivity factors, and exposure durations. The cancer risks calculated for individual age groups are summed to estimate the cancer risk for each receptor. Chronic cancer and hazard risks were calculated using values from OEHHA's 2015 HRA guidance.[43] In accordance with BAAQMD guidance, residential cancer risks assumed a 30-year exposure duration.

Four cancer risk scenarios were evaluated for the Proposed Project. The four exposure scenarios were developed to capture the maximum risks from Project construction and operations. Due to the complex timing of Project construction, the selection of exposure scenarios took into consideration the magnitude of potential activity associated with each year. Scenario 1 starts at the beginning of construction and captures initial demolition and grading. Scenario 2 starts after construction has begun and is intended to capture the maximum amount of overlapping construction activities that would occur during Project construction. Starting a receptor's exposure any time after these two scenarios would ignore the heaviest construction that occurs at the beginning of the Project. Therefore, these two exposure scenarios are designed to capture the maximum construction impacts. Scenario 3 starts when onsite residents move into the completed buildings while construction is still ongoing around them and captures overlapping construction and operational impacts on onsite residents. Lastly, Scenario 4 captures the fully operational Project once construction has concluded. The four exposure scenarios capture the maximum amount of health risk for on- and offsite receptors experiencing impacts from construction and operations. Refer to Appendix 3.4-1 for the health risk results and additional assumptions and refer to Appendix 3.4-2 for health risk calculations.

Summary of Analysis in the ConnectMenlo EIR

The ConnectMenlo EIR analyzed the following impacts that would result from implementing the updates to the Land Use and Circulation Elements and the M-2 Area Zoning Update:[44]

- Impacts related to Clean Air Plan consistency were analyzed in the ConnectMenlo EIR as Impact AQ-1 (pages 4.2-21 to 4.2-35). It was determined that ConnectMenlo would be consistent with the goals and applicable control measures of the 2010 Bay Area Clean Air Plan. In addition, the ConnectMenlo Final EIR determined that implementation of the ConnectMenlo project would result in lower VMT

[42] Ibid.

[43] Office of Environmental Health Hazard Assessment. 2015. *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments.* February. Available: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: March 15, 2022.

[44] City of Menlo Park. 2016. *ConnectMenlo: General Plan Land Use and Circulation Elements and M-2 Zoning Update for the City of Menlo Park*. (June 1.) Prepared by Placeworks, Berkeley, CA. Menlo Park, CA. Available: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed: March 14, 2022.

per service population than under existing conditions. In addition, the ConnectMenlo Final EIR states that, pursuant to the City's Zoning Ordinance update, projects that require preparation of a transportation demand management (TDM) plan are required to reduce trip generation by 20 percent below standard use rates. For these reasons, the ConnectMenlo Final EIR determined that implementation of ConnectMenlo would be consistent with air quality planning efforts in the SFBAAB and would not hinder BAAQMD's ability to attain the CAAQS or NAAQS, and this impact would be less than significant.

- Impacts related to criteria pollutant emissions were analyzed in the ConnectMenlo EIR as Impact AQ-2 (pages 4.2-35 to 4.2-42). It was determined that construction emissions associated with individual development projects could generate emissions of criteria air pollutants and TACs. This would require subsequent environmental review of future development projects to assess potential impacts relative to BAAQMD-recommended project-level thresholds. Construction emissions from buildout of future projects within Menlo Park, including the Proposed Project, would include 1) exhaust emissions from off-road diesel-powered construction equipment; 2) dust generated by demolition, grading, earthmoving, and other construction activities; 3) exhaust emissions from on-road vehicles; and 4) off-gas emissions of ROG associated with the application of asphalt, paint, and architectural coatings. The ConnectMenlo Final EIR found that construction-related impacts would be significant and identified Mitigation Measures AQ-2b1 and AQ-2b2 to reduce impacts to the extent feasible. Mitigation Measure AQ-2b1 requires implementation of BAAQMD Basic Construction Mitigation Measures for all construction projects in the city to reduce particulate matter emissions. Mitigation Measure AQ-2b2 requires implementation of additional BAAQMD-approved mitigation measures (e.g., requiring best available control technology for construction equipment to reduce emissions, minimizing idle time of construction equipment to 2 minutes, etc.) if subsequent environmental review determines that future individual development projects in Menlo Park could generate construction exhaust emissions in excess of the BAAQMD-recommended significance thresholds. Mitigation Measure AQ-2b1 also requires, prior to issuance of building permits, applicants of development project that would be subject to CEQA and exceed the screening sizes in BAAQMD's CEQA Guidelines to prepare and submit to the City of Menlo Park a technical assessment that evaluates potential project construction-related air quality impacts (the AQTR prepared and submitted for the Proposed Project meets this requirement). Even with implementation of these measures, the ConnectMenlo Final EIR determined that construction-period impacts associated with buildout of ConnectMenlo would be significant and unavoidable. The ConnectMenlo EIR noted that identification of this significant and unavoidable program-level impact does not preclude a finding of less than significant for subsequent projects that comply with BAAQMD screening criteria or meet applicable thresholds of significance.

The ConnectMenlo Final EIR found that emissions of criteria air pollutants and precursors associated with the operation of new development under ConnectMenlo would generate a substantial net increase in emissions that would exceed the BAAQMD regional significance thresholds. Because emissions generated by cumulative development within the city could exceed the regional significance thresholds, any development project could contribute to an increase in adverse health effects in the SFBAAB until the attainment standards are met. Criteria air pollutant emissions would be generated from onsite area sources (e.g., landscaping fuel, consumer products), vehicle trips generated by individual projects, and onsite combustion of natural gas for space and water heating. The ConnectMenlo Final EIR identified Mitigation Measure AQ-2a, which requires implementation of BAAQMD-approved mitigation measures if subsequent environmental review determines that future development projects in Menlo Park could generate operational emissions in excess of the BAAQMD significance thresholds. Even with

implementation of these measures, the ConnectMenlo Final EIR determined that operational impacts associated with buildout of ConnectMenlo would be significant and unavoidable. The ConnectMenlo EIR noted that the identification of this significant and unavoidable program-level impact does not preclude a finding of less than significant for subsequent projects that comply with BAAQMD screening criteria or meet applicable thresholds of significance.

- Impacts related to the exposure of sensitive receptors to pollutant concentrations were analyzed in the ConnectMenlo EIR as Impact AQ-3 (pages 4.2-43 to 4.2-50). It was determined the that the increase in traffic associated with buildout under ConnectMenlo would not result in, or contribute to, localized concentrations of CO that would exceed applicable federal and state ambient air quality standards. The ConnectMenlo EIR also determined that new land uses in Menlo Park that involve trucks and truck idling and the use of off-road equipment at warehousing operations could generate substantial DPM emissions. The ConnectMenlo Final EIR required implementation of Mitigation Measure AQ-3a to reduce impacts associated with the generation of DPM emissions from non-residential land uses in the City to less than significant. This mitigation measure would apply to the Proposed Project. Although the ConnectMenlo EIR noted that an evaluation of the impact of the environment on a project is not a CEQA requirement, unless the impact would exacerbate an environmental hazard, the ConnectMenlo Final EIR also determined that the placement of new sensitive land uses, such as residential units, near major sources of air pollution could expose sensitive receptors to elevated concentrations of such pollutants. As such, the ConnectMenlo Final EIR identified Mitigation Measure AQ-3b to ensure that air pollution levels at sensitive receptors meet the incremental risk thresholds established by BAAQMD. With implementation of ConnectMenlo Mitigation Measure AQ-3b, the ConnectMenlo Final EIR concluded that impacts would be less than significant.

Impacts and Mitigation Measures

Impact AQ-1: Conflict with or Obstruct Implementation of the Applicable Air Quality Plan. The Proposed Project would conflict with or obstruct implementation of the applicable air quality plan. (SU)

Since certification of the ConnectMenlo EIR, BAAQMD adopted its 2017 Clean Air Plan.[45] The 2017 Clean Air Plan is a comprehensive plan to improve air quality and protect public health in the SFBAAB. It defines control strategies to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduce GHG emissions to protect the climate. A project is considered to be consistent with the Clean Air Plan when it 1) supports the goals of the Clean Air Plan, 2) includes applicable control measures from the Clean Air Plan, and 3) would not disrupt or hinder implementation of any control measure included in the Clean Air Plan.

The sections that follow provide an evaluation of the Proposed Project's consistency with each of the criteria.

[45] Bay Area Air Quality Management District. 2017. *Final 2017 Clean Air Plan*. April 17. Available: https://www.baaqmd.gov/ ~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: March 15, 2022.

Clean Air Plan Goals

The primary goals of the Clean Air Plan are to attain air quality standards, reduce the population's exposure to pollutants, protect public health in the Bay Area, reduce GHG emissions, and protect the climate. BAAQMD has established mass emissions thresholds of significance for determining whether emissions associated with construction or operation of a project would represent a cumulatively considerable contribution to adverse air quality in the SFBAAB and conflict with planning efforts to attain or maintain ambient air quality standards. The health and hazard thresholds were established to protect public health. As discussed under Impact AQ-2 in Tables 3.4-12 and 3.4-14, implementation of the Proposed Project would result in significant and unavoidable impacts related to operational emissions of ROG. Consequently, the Proposed Project would conflict with the Clean Air Plan goals to attain ambient air quality standards.

Development of the 2017 Clean Air Plan strategy was based on regional population and employment projections for the Bay Area compiled by the Association of Bay Area Governments during preparation of Plan Bay Area. Demographic trends incorporated into Plan Bay Area were used to determine VMT in the Bay Area; BAAQMD uses the trends to forecast future air quality. The SFBAAB is currently designated a nonattainment area for O_3 (federal and state ambient air quality standards), $PM_{2.5}$ (federal and state ambient air quality standards), and PM_{10} (state ambient air quality standards only). The 2017 Clean Air Plan is based on Plan Bay Area 2040. According to the ConnectMenlo EIR, the 2010 Clean Air Plan's growth projections would exceed the projections of the Association of Bay Area Governments. The Proposed Project would be consistent with the goals and policies of ConnectMenlo. The increased population and employment associated with the Proposed Project were studied in the ConnectMenlo EIR. Furthermore, Section 3.13, *Population and Housing,* notes that it was later determined that the ConnectMenlo growth projections would align with future regional growth projections promulgated by ABAG. Notwithstanding, as noted above, due to the ROG exceedance, the Proposed Project would conflict with the goals of the Clean Air Plan to attain ambient air quality standards.

Clean Air Plan Control Measures

Control strategies in the Clean Air Plan include measures in the following categories: Stationary-Source Control Measures, Transportation Control Measures, Energy Control Measures, Building Control Measures, Agriculture Control Measures, Natural and Working Lands Control Measures, Waste Management Control Measures, and Water Control Measures. The Proposed Project's consistency with each of these strategies is discussed below.

Stationary-Source Control Measures

The stationary-source control measures, which are designed to reduce emissions from stationary sources such as metal melting facilities, cement kilns, refineries, and glass furnaces, are incorporated into rules adopted by BAAQMD and then enforced by BAAQMD permit and inspection programs. The Proposed Project would include approximately 13 diesel-powered emergency generators, which would require permits from BAAQMD to operate. As part of the permit review process, operation of the emergency generators would be required to comply with BAAQMD permitting requirements, which incorporate stationary-source control measures from the Clean Air Plan; therefore, the Proposed Project would be consistent with the stationary-source control measures of the Clean Air Plan.

Transportation Control Measures

As part of the Clean Air Plan, BAAQMD identifies transportation control measures to decrease emissions of criteria pollutants, TACs, and GHGs by reducing demand for motor vehicle travel, promoting efficient vehicles and transit service, decarbonizing transportation fuels, and electrifying motor vehicles and equipment. The Proposed Project would develop a master-planned, mixed-use neighborhood with up to 1,730 residential units, a grocery store/supermarket, neighborhood-serving retail uses, office space, a hotel, new bicycle and pedestrian connections, and open space. The Proposed Project would also develop TDM plans to provide trip reduction measures and reduce vehicle traffic in and around the Project Site, as discussed in Section 3.3, *Transportation*. In addition, the Proposed Project would not exceed the City's VMT thresholds with implementation of Mitigation Measure TRA-1. Mitigation Measure TRA-1 would reduce the Proposed Project's residential VMT a minimum of 16 percent through active TDM measures.[46] Furthermore, the Proposed Project would provide adequate bicycle and pedestrian infrastructure and represent an overall improvement to bicycle and pedestrian access and circulation. Within the Project Site, pedestrian walkways would be incorporated around the Proposed Project buildings. The Proposed Project would also be subject to regulatory programs related to fuel and vehicle efficiency as well as vehicle electrification, all of which would result in emissions reductions. Therefore, the Proposed Project would promote BAAQMD initiatives to reduce vehicle trips and VMT and increase the use of alternative means of transportation. Therefore, the Proposed Project would be consistent with the applicable transportation control measures of the Clean Air Plan.

Energy Control Measures

The Clean Air Plan also includes energy control measures, which are designed to reduce emissions of criteria air pollutants, TACs, and GHGs by decreasing the amount of electricity consumed in the Bay Area as well as the carbon intensity of electricity used by switching to less GHG-intensive fuel sources for electricity generation. Because these measures apply to electrical utility providers and local government agencies, and not individual projects, the energy control measures of the Clean Air Plan are not applicable to the Proposed Project. However, as a component of compliance with Sections 16.43.140 (Office) and 16.45.130 (Residential Mixed Use) of the Menlo Park Municipal Code, the Proposed Project on the main Project Site would meet 100 percent of its energy demand by purchasing renewable electricity through either Peninsula Clean Energy or Pacific Gas and Electricity Company. Per the requirements of Chapters 16.43.140 (Office) and 16.45.130 (Residential Mixed Use), the Proposed Project would offset non-renewable energy used onsite (e.g., natural gas and any tenants that do not purchase 100 percent renewable energy from Peninsula Clean Energy or Pacific Gas and Electricity Company). It is anticipated that this energy use would be offset through onsite renewable energy generation. In addition, the Proposed Project would install electric-vehicle charging stations, photovoltaic solar panels, and solar hot water systems. As further discussed in Section 3.6, *Greenhouse Gas Emissions*, of the Draft EIR, the Proposed Project would meet a net-zero GHG emissions threshold with respect to building operations.

Although the Proposed Project would provide natural gas connections, natural gas would be consumed only for retail culinary uses, if an exception is granted by the Environmental Quality Commission or a designated body, per the requirements of the City's reach code. Furthermore, the Proposed Project on the main Project Site would be consistent with Sections 16.43.140 (Office) and 16.45.130 (Residential Mixed Use) of the Menlo Park Municipal Code and purchase certified renewable energy credits and/or certified

[46] Willow Village TDM Plan. Prepared for Peninsula Innovation Partners. Fehr & Peers, Inc. July 2021.

renewable energy offsets annually in an amount equal to the annual natural gas demand of the Proposed Project. Therefore, the Proposed Project would be consistent with applicable local energy control measures that support the energy control measures in the Clean Air Plan.

Building Control Measures

BAAQMD has authority to regulate emissions from certain sources in buildings, such as boilers and water heaters, but has limited authority to regulate buildings themselves. Therefore, the strategies in the control measures for this sector focus on working with local governments that do have authority over local building codes to facilitate adoption of best management practices and policies related to GHGs. Therefore, the building control measures of the Clean Air Plan are not applicable to the Proposed Project. However, the Proposed Project would comply with California Green Building Standards Code (CALGreen) standards and other code amendments, such as local reach codes. In addition, the Proposed Project would be designed to achieve Leadership in Energy and Environmental Design (LEED) Gold certification for building design and construction, with the exception of buildings with an area of less than 10,000 square feet, which would not be certified. Smaller buildings (e.g., Town Square south pavilion, park restroom building) would meet the applicable CALGreen requirements. Therefore, the Proposed Project would be consistent with the applicable building control measures of the Clean Air Plan.

Agriculture Control Measures

The agriculture control measures are designed to reduce primarily emissions of methane. Because the Proposed Project would not include any agricultural activities, the agriculture control measures of the Clean Air Plan are not applicable to the Proposed Project.

Natural and Working Lands Control Measures

The natural and working lands control measures focus on increasing carbon sequestration on rangelands and wetlands. They also encourage local governments to adopt ordinances that promote urban tree planting. Because the Proposed Project would not disturb rangelands and any impacts on offsite wetlands that cannot be avoided would be minimal and properly mitigated, the natural and working lands control measures of the Clean Air Plan are not applicable to the Proposed Project.

Waste Management Control Measures

The waste management control measures focus on reducing or capturing methane emissions from landfills and composting facilities, diverting organic materials away from landfills, and increasing waste diversion rates through efforts to reduce, reuse, and recycle. The Proposed Project would comply with local requirements for waste management (e.g., recycling and composting), including preparation of zero waste plans to increase diversion rates during the occupancy phase of each building, per the requirements of the City's Zoning Ordinance. Therefore, the Proposed Project would be consistent with the waste management control measures of the Clean Air Plan.

Water Control Measures

The water control measures focus on reducing emissions of criteria pollutants, TACs, and GHGs by encouraging water conservation, limiting GHG emissions from publicly owned treatment works, and promoting the use of biogas recovery systems. Because these measures apply to publicly owned treatment works and local government agencies, and not individual projects, the water control measures are not applicable to the Proposed Project.

Summary and Mitigation Measures

As discussed above, the agriculture control measures, natural and working lands control measures, and water control measures of the Clean Air Plan would not be applicable to the Proposed Project. The Proposed Project would be consistent with the applicable stationary-source control measures, energy control measures, building control measures, and waste control measures included in the Clean Air Plan. However, as discussed further in Impact AQ-2, the Proposed Project would exceed BAAQMD's construction NO_X threshold and BAAQMD's operational ROG threshold as shown in Summary Tables A, B, and C of the AQTR, and BAAQMD's cancer risk threshold as shown in Summary Table D of the AQTR. To reduce Proposed Project criteria pollutant emissions and cancer risk, the Proposed Project would implement Mitigation Measures AQ-1.1 and AQ-1.2 as well as ConnectMenlo Mitigation Measure AQ-2b1. The AQTR fulfills the air quality technical assessment requirements of Mitigation Measure AQ-2b2 from the ConnectMenlo EIR. Mitigation Measures AQ-1.1 and AQ-1.2 satisfy the mitigation requirements of ConnectMenlo Mitigation Measure AQ-2b2.

With implementation of Mitigation Measures AQ-1.1 and AQ-1.2 and Mitigation Measures AQ-2b1 and AQ-2b2 from the ConnectMenlo EIR, the Proposed Project would result in less-than-significant impacts related to NO_X emissions and TAC exposures. The Proposed Project would also be consistent with the transportation control measures with implementation of Mitigation Measure TRA-1. However, as discussed above under Clean Air Plan goals and further in Impact AQ-2, the Proposed Project's ROG emissions would remain above the BAAQMD ROG threshold after implementation of all mitigation measures. Therefore, the Proposed Project would possibly disrupt or hinder implementation of the current Clean Air Plan, and this impact would be ***significant and unavoidable***.

Project Mitigation Measure AQ-1.1: Use Clean Diesel-powered Equipment during Construction to Control Construction-related Emissions.

The Project Sponsor shall either:

- Ensure all off-road construction equipment with greater than 25 horsepower and operating for more than 20 hours total over the entire duration of construction activities have engines that meet or exceed either EPA or ARB Tier 4 Final off-road emission standards. The exception to this requirement allows a cumulative total of 618,028 horsepower-hours over the duration of construction activities before residents move onsite and 34,716 horsepower-hours over the duration of construction activities after residents move onsite from the operation of off-road construction equipment that meets standards that are less than Tier 4 Final; or
- Prior to issuance of building permits, provide supplemental analysis prepared by a qualified air quality specialist to the City for approval that shows that emissions of ROG and NO_X, the excess lifetime cancer risk, and the $PM_{2.5}$ concentration would not exceed the thresholds from the 2017 BAAQMD CEQA Air Quality Guidelines using the mix of equipment proposed by the applicant.

Project Mitigation Measure AQ-1.2: Architectural Coatings.

The Project Sponsor shall use super-compliant architectural coatings during construction and operation for all buildings, which shall have VOC content that meet SCAQMD Rule 1113 Architectural Coatings as revised on February 5, 2016.

Impact AQ-2: Cumulatively Considerable Net Increase in Criteria Pollutants. The Proposed Project would result in a cumulative net increase in a criteria pollutant for which the Project region is classified as a nonattainment area under an applicable federal or state ambient air quality standard. (SU)

According to the BAAQMD CEQA Guidelines, to meet air quality standards for criteria air pollutant and air precursor impacts, the Proposed Project must not:

- Contribute to CO concentrations that exceed the state ambient air quality standards;
- Generate daily construction emissions of ROG, NO_X, or $PM_{2.5}$ (exhaust) greater than 54 pounds per day or PM_{10} exhaust emissions greater than 82 pounds per day; or
- Generate operational emissions of ROG, NO_X, or $PM_{2.5}$ greater than 10 tons per year, or 54 pounds per day, or PM_{10} emissions greater than 15 tons per year, or 82 pounds per day.

Construction

Construction activities would generate criteria pollutant emissions from off-road equipment exhaust, construction workers' vehicles and heavy-duty trucks traveling to and from the Project Site and offsite utility installation areas, the application of architectural coatings, and paving activities. Fugitive PM_{10} and $PM_{2.5}$ dust would also be generated during soil movement and disturbance. The amount of emissions generated on a daily basis would vary, depending on the intensity and types of construction activities occurring simultaneously. Average daily emissions estimates were calculated to assess construction impacts, accounting for onsite and offsite construction activities. The unmitigated and mitigated average daily criteria air pollutant emissions that would be generated during Proposed Project construction are shown in Table 3.4-6. Please refer to Appendix 3.4-1 for detailed assumptions and daily construction-related emissions estimates and refer to 3.4-2 for air quality emissions calculations.

Table 3.4-6. Estimated Unmitigated Average Daily Construction Emissions of Criteria Air Pollutants and Precursors

	Average Daily Emissions (lb/day)[a]			
Construction Year	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Year 1	2.8	56	1.2	1.1
Year 2	4.5	64	1.4	1.3
Year 3	19	124	5.8	5.4
Year 4	52	53	2.3	2.1
Year 5	63	45	2.1	2.0
Year 6	35	12	0.7	0.6
Maximum Average Daily Emissions	63	124	5.8	5.4
BAAQMD Significance Thresholds	54	54	82	54
Exceeds Threshold?	Yes	Yes	No	No

Source: Modeling files provided in Appendix 3.4-2.
lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 or less
[a] BAAQMD construction thresholds for PM_{10} and $PM_{2.5}$ evaluate only exhaust emissions. Fugitive dust emissions would be controlled using best management practices.

As shown in Table 3.4-6, construction of the Proposed Project would result in unmitigated emissions that would exceed BAAQMD's recommended thresholds for ROG and NO_X. Unmitigated particulate matter exhaust emissions would not exceed BAAQMD's particulate matter exhaust thresholds. As shown in Table 3.4-7, after implementation of Mitigation Measures AQ-1.1 and AQ-1.2 and Mitigation Measures AQ-2b1 and AQ-2b2 from the ConnectMenlo EIR, construction criteria pollutant emissions would be below all applicable BAAQMD thresholds. Therefore, Project-related construction activities would not result in a cumulatively considerable net increase in any criteria air pollutant for which the SFBAAB is designated as a nonattainment area with respect to federal or state ambient air quality standards. This impact would be ***less than significant with mitigation.***

Table 3.4-7. Estimated Mitigated Average Daily Construction Emissions of Criteria Air Pollutants and Precursors

	Average Daily Emissions (lb/day)[a]			
Construction Year	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
Year 1	1.5	43	0.4	0.4
Year 2	2.7	45	0.5	0.5
Year 3	10	47	0.8	0.8
Year 4	24	29	0.4	0.4
Year 5	28	22	0.3	0.3
Year 6	15	5.4	0.1	0.1
Maximum Average Daily Emissions	28	47	0.8	0.8
BAAQMD Significance Thresholds	54	54	82	54
Exceeds Threshold?	No	No	No	No

Source: Modeling files provided in Appendix 3.4-2.
lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 or less
[a] BAAQMD construction thresholds for PM_{10} and $PM_{2.5}$ evaluate only exhaust emissions. Fugitive dust emissions would be controlled using best management practices.

ConnectMenlo Mitigation Measures

The following mitigation measures from the ConnectMenlo EIR would apply to the Proposed Project:

> **ConnectMenlo AQ-2b1:** Prior to building permit issuance, the City shall require applicants for all development projects in the city to comply with the current Bay Area Air Quality Management District's (BAAQMD) basic control measures for reducing construction emissions of PM_{10} (Table 8-1, Basic Construction Mitigation Measures Recommended for All Proposed Projects, of the BAAQMD CEQA Guidelines[47]).
>
> **ConnectMenlo AQ-2b2:** Prior to issuance of a building permit, development projects in the City that are subject to CEQA and exceed the screening sizes in the BAAQMD's CEQA Guidelines shall prepare and submit to the City of Menlo Park a technical assessment evaluating potential project construction-related air quality impacts. The evaluation shall be prepared in conformance with the BAAQMD methodology for assessing air quality impacts. If construction-related criteria air pollutants are determined to have the potential to exceed the BAAQMD thresholds of significance, as identified in the BAAQMD CEQA Guidelines, the project applicant is required to incorporate mitigation measures to reduce air pollutant emissions

[47] In the 2017 Update to the BAAQMD CEQA Guidelines, these measures are in Table 8-2.

during construction activities to below these thresholds (e.g., Table 8-2, Additional Construction Mitigation Measures Recommended for projects with Construction Emissions Above the Threshold of the BAAQMD CEQA Guidelines, or applicable construction mitigation measures subsequently approved by BAAQMD[48]). These identified measures shall be incorporated into all appropriate construction documents (e.g., construction management plans), subject to the review and approval of the Planning Division prior to building permit issuance. (The AQTR prepared and submitted for the Proposed Project fulfills the air quality technical assessment requirement.)

BAAQMD's CEQA Guidelines consider fugitive dust impacts to be less than significant with application of BMPs, which are included in ConnectMenlo AQ-2b1. The BMPs require applicants for future development projects to comply with BAAQMD's basic control measures for reducing construction emissions of PM_{10}. If BMPs are not implemented, dust impacts would be potentially significant. Therefore, BMPs would be required and implemented to reduce impacts from construction-related fugitive dust emissions, including any cumulative impacts. With implementation of ConnectMenlo AQ-2b1 and AQ-2b2, fugitive dust emissions would be reduced, and the impact would be ***less than significant with mitigation***.

Operation

The criteria pollutant emissions that would be generated during Proposed Project operations were quantified using CalEEMod methodologies and EMFAC2021. Long-term emissions would be caused by vehicle trips, area sources (e.g., cleaning supplies, architectural coatings, landscape maintenance equipment), and the onsite combustion of natural gas for commercial culinary purposes. In addition, stationary-source emissions would be associated with intermittent use of thirteen diesel-powered emergency generators with ratings ranging from 324 to 2,900 horsepower and each would conservatively be assumed to be tested 50 hours per year. Net Proposed Project emissions are calculated by subtracting existing year 2019 operational criteria pollutant emissions from full buildout year 2026 conditions.

The Proposed Project's estimated unmitigated daily operational emissions for existing year 2019, full buildout year 2026, and net emissions are presented in Tables 3.4-8, 3.4-9, and 3.4-10, respectively, and compared to BAAQMD's recommended mass emission thresholds. Please refer to Appendix 3.4-1 for detailed assumptions and daily operational emissions estimates and refer to Appendix 3.4-2 for air quality emissions calculations.

Table 3.4-8. Estimated Unmitigated Average Daily Operational Emissions Existing Conditions (Year 2019)

	Average Daily Emissions (lb/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Architectural Coating	3	0	0	0
Consumer Products	19	0	0	0
Landscaping	< 1	< 1	< 1	< 1
Onsite Natural Gas Combustion	1	8	1	1
Vehicle Trips (Mobile Sources)	27	44	22	5
Backup Diesel Generator	< 1	< 1	< 1	< 1
Total Operational Emissions	50	52	23	5

Modeling files provided in Appendix 3.4-2.
Totals may not add up because of rounding.
lb/day = pounds per day; ROG= reactive organic gases; NO_X = nitrogen oxide; PM_{10} = particulate matter no more than 10 microns in diameter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter
[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ include both fugitive dust and exhaust emissions.

[48] In the 2017 Update to the BAAQMD CEQA Guidelines, these measures are in Table 8-3.

Table 3.4-9. Estimated Unmitigated Average Daily Operational Emissions Full Buildout Conditions (Year 2026)

	Average Daily Emissions (lb/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Architectural Coating	12	0	0	0
Consumer Products	68	0	0	0
Landscaping	2	1	< 1	< 1
Onsite Natural Gas Combustion	< 1	1	< 1	< 1
Vehicle Trips (Mobile Sources)	55	64	58	11
Backup Diesel Generators	1	7	< 1	< 1
Total Operational Emissions	137	73	59	12

Modeling files provided in Appendix 3.4-2.

Notes:

Totals may not add up because of rounding.

lb/day = pounds per day; ROG= reactive organic gases; NO_X = nitrogen oxide; PM_{10} = particulate matter no more than 10 microns in diameter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter

[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ include both fugitive dust and exhaust emissions.

Table 3.4-10. Estimated Net Unmitigated Average Daily Operational Emissions

	Average Daily Emissions (lb/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Existing Conditions (Year 2019)	50	52	23	5
Full Build-Out Conditions (Year 2026)	137	73	59	12
Total Net Operational Emissions	88	21	37	7
BAAQMD Significance Threshold	54	54	82	54
Exceeds Threshold?	Yes	No	No	No

Modeling files provided in Appendix 3.4-2.

Notes:

Totals may not add up because of rounding.

lb/day = pounds per day; ROG= reactive organic gases; NO_X = nitrogen oxide; PM_{10} = particulate matter no more than 10 microns in diameter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter

[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ include both fugitive dust and exhaust emissions.

As shown in Table 3.4-10, net operation of the Proposed Project would not generate levels of NO_X or particulate matter that would exceed BAAQMD-recommended mass emission thresholds. However, operation of the Proposed Project would generate levels of ROG that would exceed BAAQMD's ROG threshold. ROG emissions from consumer products constitute the majority of operational ROG emissions associated with the Proposed Project. Therefore, unmitigated operation of the Proposed Project would result in a cumulatively considerable net increase in any criteria air pollutant for which the SFBAAB is designated as a nonattainment area with respect to the federal or state ambient air quality standards.

Implementation of Mitigation Measure AQ-1.2 would decrease Proposed Project full build-out operational ROG emissions, as shown in Table 3.4-11. Mitigation Measure AQ-1.2 requires the Project Sponsor to use low-VOC architectural coatings for all Proposed Project buildings. However, as shown in Table 3.4-12, net mitigated operational ROG emissions would still exceed BAAQMD's ROG threshold. Most of the emissions that contribute to this exceedance result from the volume of consumer products used, which is dependent on a project's size. Larger projects have more people who use more consumer products, such as hair spray, deodorant, cleaning products, etc., than smaller projects but are subject to the same mass emissions threshold. The City and Project Sponsor have minimal control over what consumer products users purchase, and there are no additional mitigation measures to reduce ROG from consumer products. Other main contributors to ROG emissions are vehicles. As discussed in the Transportation section, with mitigation, the Proposed Project would comply with the City's VMT threshold. Therefore, mitigated operation of the Proposed Project would result in a cumulatively considerable net increase in any criteria air pollutant for which the SFBAAB is designated as a nonattainment area with respect to the federal or state ambient air quality standards. This impact would be ***significant and unavoidable*.**

Table 3.4-11. Estimated Mitigated Average Daily Operational Emissions Full Buildout Conditions (Year 2026)

	Average Daily Emissions (lb/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Architectural Coating	5	0	0	0
Consumer Products	68	0	0	0
Landscaping	2	1	< 1	< 1
Onsite Natural Gas Combustion	< 1	1	< 1	< 1
Vehicle Trips (Mobile Sources)	55	64	58	11
Backup Diesel Generators	1	7	< 1	< 1
Total Operational Emissions	130	73	59	12

Modeling files provided in Appendix 3.4-2.

Totals may not add up because of rounding.

lb/day = pounds per day; ROG= reactive organic gases; NO_X = nitrogen oxide; PM_{10} = particulate matter no more than 10 microns in diameter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter

[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ include both fugitive dust and exhaust emissions.

Table 3.4-12. Estimated Net Mitigated Average Daily Operational Emissions

	Average Daily Emissions (lb/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Existing Conditions (Year 2019)	50	52	23	5
Full Build-Out Conditions (Year 2026)	130	73	59	12
Total Net Operational Emissions	80	21	37	7
BAAQMD Significance Threshold	54	54	82	54
Exceeds Threshold?	Yes	No	No	No

Totals may not add up because of rounding.

lb/day = pounds per day; ROG= reactive organic gases; NO_X = nitrogen oxide; PM_{10} = particulate matter no more than 10 microns in diameter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter

[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ include both fugitive dust and exhaust emissions.

Construction + Operations

Construction is expected to occur during Project operation because the Project will be constructed over a period of several years. In years when construction is scheduled to coincide with Project operation, construction emissions were combined with operational emissions. This analysis conservatively assumed that the buildings constructed in each year of the construction program would be occupied and fully operational upon completion. This is conservative because occupancy and operation of each phase would likely ramp up over time. The combined construction and operational emissions were compared with average daily emissions thresholds, using the 365 days per year to average annual emissions for both construction and operations, as shown in Table 3.4-13 and Table 3.4-14. Please refer to Appendix 3.4-1 for detailed assumptions and daily construction-related emissions estimates. Please refer to Appendix 3.4-2 for criteria pollutant emissions calculations.

As shown in Table 3.4-13, construction plus operation of the Proposed Project would result in unmitigated emissions that would exceed BAAQMD's recommended thresholds for ROG and NO_X. Unmitigated particulate matter emissions would not exceed BAAQMD's particulate matter thresholds. As shown in Table 3.4-14, after implementation of Mitigation Measures AQ-1.1 and AQ-1.2 as well as ConnectMenlo Mitigation Measures AQ-2b1 and AQ-2b2, construction plus net operational emissions would remain in excess of BAAQMD's recommended threshold for ROG. Therefore, mitigated construction plus operation of the Proposed Project would result in a cumulatively considerable net increase in any criteria air pollutant for which the SFBAAB is designated as a nonattainment area with respect to the federal or state ambient air quality standards. This impact would be ***significant and unavoidable***.

Table 3.4-13. Estimated Unmitigated Average Daily Construction plus Operational Emissions of Criteria Air Pollutants and Precursors

	Average Daily Emissions (lb/day)[a]			
Construction Year	**ROG**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Year 1	-50	-50	-23	-5.2
Year 2	-45	11	-21	-3.9
Year 3	-31	72	-17	0.2
Year 4	9.3	7.2	-17	-2.2
Year 5	73	29	7.7	2.7
Year 6	97	21	30	6.1
Full Buildout	88	21	37	7.0
Maximum Average Daily Emissions	97	72	37	7
BAAQMD Significance Thresholds	54	54	82	54
Exceeds Threshold?	Yes	Yes	No	No

Source: Modeling files provided in Appendix 3.4-2.

Totals may not add up because of rounding.

lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 or less

[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ evaluate exhaust and fugitive emissions.

Table 3.4-14. Estimated Mitigated Average Daily Construction plus Operational Emissions of Criteria Air Pollutants and Precursors

	Average Daily Emissions (lb/day)[a]			
Construction Year	**ROG**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Year 1	-50	-50	-23	-5.2
Year 2	-47	-7.6	-22	-4.7
Year 3	-39	-5.1	-22	-4.4
Year 4	-19	-17	-19	-3.9
Year 5	36	6.3	5.8	1.0
Year 6	74	16	29	5.6
Full Buildout	80	21	37	7.0
Maximum Average Daily Emissions	80	21	37	7
BAAQMD Significance Thresholds	54	54	82	54
Exceeds Threshold?	Yes	No	No	No

Source: Modeling files provided in Appendix 3.4-2.

Totals may not add up because of rounding.

lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 or less

[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ evaluate exhaust and fugitive emissions.

Impact AQ-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations. The Proposed Project would expose sensitive receptors to substantial pollutant concentrations. (LTS/M)

Sensitive land uses are generally considered to include those uses where exposure to pollutants could result in health-related risks for sensitive individuals, including children and the elderly. Per BAAQMD, typical sensitive receptors are residences, hospitals, and schools. Parks and playgrounds where sensitive receptors (e.g., children and seniors) are present would also be considered sensitive receptors.[49] The nearest offsite sensitive land uses are the Wund3rSCHOOL and Open Mind School and residences generally south of the Project Site. Onsite residential receptors would occupy Proposed Project buildings as they are completed. The existing onsite Dialysis Center, which would temporarily remain onsite during construction, was also included as a sensitive receptor. The maximum health risks associated with the Dialysis Center are the same or less than the health risks presented in Tables 3.4-15 and 3.4-16 under *Scenarios 1, 2, and 3: Construction plus Operations*. See Appendix 3.4-3 for the Dialysis Center health risk memorandum.

The primary pollutants of concern with regard to health risks for sensitive receptors are criteria pollutants, specifically CO at potential intersection hot spots, asbestos, DPM, and localized $PM_{2.5}$. Each of these topics is analyzed in the paragraphs that follow.

[49] Bay Area Air Quality Management District. 2017. *California Environmental Quality Act Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: March 15, 2022.

Localized Carbon Monoxide Hot Spots

Continuous engine exhaust may elevate localized CO concentrations, resulting in hot spots. Receptors exposed to these CO hot spots may have a greater likelihood of developing adverse health effects. CO hot spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations.

Peak-hour traffic volumes at all roadways in the vicinity were analyzed to determine whether CO emitted by Project-generated traffic would exceed BAAQMD screening criteria. Maximum traffic volumes at the intersections under all scenarios would be less than BAAQMD's recommended screening criterion of 44,000 vehicles per hour. Also, intersection traffic volumes under all scenarios would not exceed the screening criterion of 24,000 vehicles per hour that BAAQMD recommends for areas where vertical and/or horizontal mixing is substantially limited. In addition, the Proposed Project would be consistent with the TDM requirements of the City/County Association of Government's Congestion Management Plan as discussed in Section 4 of the AQTR. The Proposed Project would not result in, or contribute to, a localized concentration of CO that would exceed the applicable NAAQS or CAAQS. This impact would be ***less than significant***.

Toxic Air Contaminants

Asbestos

Asbestos is a naturally occurring mineral that was previously used in building construction because of its heat resistance and strong insulating properties. Exposure to asbestos, however, has been shown to cause many disabling and fatal diseases, including lung cancer, mesothelioma, and pleural plaques. Demolition of the existing hardscape (asphalt and concrete) and buildings on the Project Site may expose workers and nearby receptors to asbestos if the material was used during construction of the original hardscape and buildings. However, the Proposed Project would comply with BAAQMD Regulation 11, Rule 2, Asbestos, Demolition, Renovation, and Manufacturing. The purpose of this rule is to control emissions of asbestos to the atmosphere during demolition and building renovation. Because the applicant would be required to control asbestos emissions according to BAAQMD regulations, receptors would not be exposed to substantial asbestos risks, and impacts associated with asbestos emissions would be ***less than significant.***

Criteria Air Pollutants

Consistent with the Friant Ranch decision, this section discusses the potential health effects that may result from significant and unavoidable ROG emissions as a result of the Proposed Project. As discussed above under Impact AQ-2, construction emissions as a result of the Project would be below the BAAQMD thresholds of significance. Operational emissions as a result of the Project would be below BAAQMD thresholds of significance for all pollutants excluding ROG, as summarized above under Impact AQ-2.

Because ROG emissions are the only pollutants that would exceed thresholds of significance, the resulting criteria pollutant in consideration for potential health effects is ozone. Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG, also sometimes referred to as volatile organic compounds [VOCs] by some regulatory agencies) and NO_X in the presence of sunlight. The main sources of ROG and NO_X, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by

wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases, such as asthma, bronchitis, and emphysema.

As the formation of ozone is due to complex reactions between ROG and NO_X emissions in the presence of sunlight, the process of determining impacts is computationally intensive. The BenMAP-CE is an open source model from the EPA that estimates health impacts resulting from changes in air quality—specifically, ground-level ozone and fine particles. BenMAP relies on reported air quality information and health literature and is used by the EPA to inform the process for setting the National Ambient Air Quality Standards at levels protective of human health. The BenMAP health endpoints for ozone that are typically used in national rulemaking include mortality, emergency room visits (respiratory), and hospital admissions (respiratory). There are assumptions associated with several of the BenMAP inputs, including exposure estimates and health statistics, which can add to the uncertainty in the BenMAP results. Also, because BenMAP relies on epidemiological studies that are not necessarily specific to the Study Area and local populations, there is some uncertainty regarding the generalizability of the epidemiological results. Accordingly, there are limitations related to determining the precise health effect caused by a project's addition of air pollutants to an air basin on any individual. Instead, modeling is most useful to provide how health outcomes for a general population are correlated to air quality.

Results from assessments completed for other similarly-sized projects in the SFBAAB have shown that health impacts from exceedances of BAAQMD's ROG and NO_X thresholds would be minimal. As noted above, while only Project operational ROG emissions would exceed thresholds of significance, emissions of both NO_X and ROG are presented for three project analyses in the Bay Area for comparison to the Proposed Project as these are the primary precursors to ozone. For example, for three projects in the Bay Area with ROG and NO_X emissions that ranged from 79–458 lbs/day and 125–153 lbs/day, respectively, potential health effects were far below background incidence rates for all health endpoints.[50]

As summarized above, the Proposed Project is estimated to generate 21 lbs/day of NO_X and 80 lbs/day of ROG, which is similar to or below the emission levels of the projects referenced above. We thus anticipate that health impacts would be similarly de minimis.

Toxic Air Contaminants and Localized $PM_{2.5}$

DPM is a carcinogen contained in the exhaust of diesel internal-combustion engines. Project-related construction activities would generate DPM (PM_{10} exhaust)[51] from off-road equipment and heavy-duty trucks. $PM_{2.5}$ exhaust and fugitive dust emissions would be generated from off-road equipment, onsite soil movement, and on-road travel of heavy-duty trucks and workers' vehicles.

Operational activities would generate TACs from vehicles and the emergency generators. DPM would be released from emergency generators during testing and maintenance as well as the use of diesel-fueled vehicles. Other TACs, in the form of ethylbenzene, toluene, hexane, xylenes, benzene, styrene, 1,3-butadiene, acrolein, propylene, formaldehyde, methanol, acetaldehyde, methyl ethyl ketone, and naphthalene, would be released from gasoline-fueled vehicles. $PM_{2.5}$ exhaust and fugitive dust emissions would also be generated from Project vehicles as well as the emergency generators. These activities could expose offsite receptors to incremental increases in health risks.

[50] Ramboll US Corporation. 2022. *CEQA Air Quality, Greenhouse Gas and Health Risk Assessment Technical Report*. February. Accessed: February 21, 2022.

[51] Per BAAQMD guidance, PM_{10} exhaust is used as a surrogate for DPM.

Health impacts from exposure to DPM include cancer risks and chronic non-cancer risks. The HRA for the Proposed Project included an evaluation of annual concentrations of $PM_{2.5}$ from exhaust and fugitive dust sources. As discussed previously, the cancer risk was evaluated for four scenarios: 1) exposure beginning at the start of construction; 2) exposure beginning at the start of grading and utility installation for the Area 2[52]; 3) exposure beginning at the conclusion of Town Square and Residential/Shopping District construction when residents would move in; and 4) exposure beginning at the conclusion of Project construction when the Project is fully operational.

Scenarios 1, 2, and 3: Construction plus Operations

Table 3.4-15 presents the maximum unmitigated health risks for sensitive receptors near the Project Site. The evaluation of cancer risk was based on a total exposure duration of 30 years. The health impacts associated with Project construction and operation at onsite sensitive receptors is also presented.[53] As shown in Table 3.4-15, the unmitigated health risk results would not exceed BAAQMD's recommended health risk thresholds for the non-cancer hazard index; however, the Proposed Project would exceed BAAQMD's cancer risk and annual $PM_{2.5}$ concentration thresholds. The maximum health risks associated with the Dialysis Center are the same or less than the health risks presented in Tables 3.4-15 and 3.4-16 under *Scenarios 1, 2, and 3: Construction plus Operations*. See Appendix 3.4-3 for the Dialysis Center health risk memorandum. Therefore, impacts would be potentially significant without mitigation.

Table 3.4-15. Estimated Unmitigated Project-Level Health Risk Results from Construction plus Operations

Scenario	Cancer Risk (cases per million)[a]	Non-Cancer Chronic Risk[b]	Annual $PM_{2.5}$ Concentrations ($\mu g/m^3$)[b]
Construction plus Operations (offsite)	58	0.11	0.56
Construction plus Operations (onsite)	172	0.23	1.1
BAAQMD Significance Threshold	10.0	1.0	0.3
Exceeds Threshold?	Yes	No	Yes

See Appendix 3.4-2 for detailed modeling files.
$\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 or less
a. Maximum cancer risk for the onsite Maximally Exposed Individual Receptor (MEIR) is associated with Scenario 3. Maximum cancer risk for the offsite MEIR is associated with Scenario 2.
b. Maximum chronic risk and $PM_{2.5}$ concentration for the onsite MEIR is associated with Scenario 3. Maximum chronic risk and $PM_{2.5}$ concentration for the offsite MEIR is associated with Scenario 1.

To mitigate the cancer risk and $PM_{2.5}$ concentration exceedances, Mitigation Measure AQ-1.1 and Mitigation Measures AQ-2b1 and AQ-2b2 from the ConnectMenlo EIR would be implemented. The Proposed Project would trigger the requirement for ConnectMenlo EIR Mitigation Measure AQ-3b and would be consistent with the measure. ConnectMenlo EIR Mitigation Measure AQ-3a would not apply to the Proposed Project. As shown in Table 3.4-16, with implementation of Mitigation Measure AQ-1.1 and Mitigation Measures AQ-2b1 and AQ-2b2 from the ConnectMenlo EIR, the incremental increase in health risks would be less than all BAAQMD-recommended health risk thresholds. Therefore, mitigated construction and operational emissions

[52] Area 2 includes Parcel 6, Parcel 7, South Garage, Office Building 1, Office Building 2, Office Building 3, Office Building 5, and Office Building 6.

[53] The maximum health risks associated with the Dialysis Center are the same or less than the health risks presented in Tables 3.4-15 and 3.4-16. See Appendix 3.4-3 for the Dialysis Center health risk memorandum.

would not expose sensitive receptors to substantial pollutant concentrations and associated health risks. Impacts would be ***less than significant with mitigation.***

Table 3.4-16. Estimated Mitigated Project-Level Health Risk Results from Construction plus Operations

Scenario	Cancer Risk (cases per million)[a]	Non-Cancer Chronic Risk[b]	Annual $PM_{2.5}$ Concentrations ($\mu g/m^3$)[b]
Construction plus Operations (offsite)	9.2	0.01	0.18
Construction plus Operations (onsite)	9.8	0.01	0.13
BAAQMD Significance Threshold	10.0	1.0	0.3
Exceeds Threshold?	No	No	No

See Appendix 3.4-2 for detailed modeling files.
Notes:
$\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter
[a.] Maximum cancer risk for the onsite MEIR is associated with Scenario 3. Maximum cancer risk for the offsite MEIR is associated with Scenario 2.
[b.] Maximum chronic risk and $PM_{2.5}$ concentration for the onsite MEIR is associated with Scenario 3. Maximum chronic risk and $PM_{2.5}$ concentration for the offsite MEIR is associated with Scenario 1.

Scenario 4: Operations Only

Table 3.4-17 presents the incremental increase in health risks for maximally affected residential receptors with respect to operational emissions only. As shown in Table 3.4-17, the unmitigated health risk from operations would be less than all BAAQMD-recommended health risk thresholds. The Proposed Project would trigger the requirement for ConnectMenlo EIR Mitigation Measure AQ-3b; the Proposed Project would be consistent with Mitigation Measure AQ-3b. In addition, ConnectMenlo EIR Mitigation Measure AQ-3a would not apply to the Proposed Project. Therefore, unmitigated operational emissions would not expose sensitive receptors to substantial pollutant concentrations, and impacts would be ***less than significant***.

Table 3.4-17. Estimated Unmitigated Project-Level Health Risk Results from Operations Only

Scenario	Cancer Risk (cases per million)[a]	Non-Cancer Chronic Risk[b]	Annual $PM_{2.5}$ Concentrations ($\mu g/m^3$)[b]
Operations Only (offsite)	3.4	0.004	0.12
Operations Only (onsite)	3.3	0.01	0.11
BAAQMD Significance Threshold	10.0	1.0	0.3
Exceeds Threshold?	No	No	No

See Appendix 3.4-2 for detailed modeling files.
Notes:
$\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter
[a.] Maximum cancer risk for the onsite MEIR is associated with Scenario 3. Maximum cancer risk for the offsite MEIR is associated with Scenario 4.
[b.] Maximum chronic risk and $PM_{2.5}$ concentration for the onsite MEIR is associated with Scenario 3. Maximum chronic risk and $PM_{2.5}$ concentration for the offsite MEIR is associated with Scenario 1.

Impact AQ-4: Other Air Emissions. The Proposed Project would result in other emissions (such as those leading to odors) that would adversely affect a substantial number of people. (LTS/M)

Although offensive odors rarely cause any physical harm, they can be unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and air districts. According to BAAQMD, land uses associated with odor complaints typically include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants.[54] Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, and schools, warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, work sites, and commercial areas.

Potential odor emitters during construction include diesel exhaust and evaporative emissions generated by asphalt paving and the application of architectural coatings. Construction-related activities near existing receptors would be temporary in nature, and construction activities would not result in nuisance odors. Potential odor emitters during operations would include exhaust from vehicles, fumes from the reapplication of architectural coatings, and emissions from the proposed sanitary sewer pump station. Odor impacts would be limited to circulation routes, parking areas, areas immediately adjacent to recently painted structures, and the proposed sanitary sewer pump station. Although such brief exhaust- and paint-related odors may be considered adverse, they would not be atypical of developed urban areas. Wastewater Pumping Facilities are land uses listed in BAAQMD's Odor Screening Distances Table. While the Wastewater Pumping Facilities considered in the Odor Screening Distance is likely a much larger scale than the Project's sewer pump station, the pump station may have the potential to emit objectionable odors. Consequently, odors from the pump station could adversely affect a substantial number of people, and impacts would be considered ***significant***.

As stated in the ConnectMenlo EIR, the following City General Plan goals and policies would serve to minimize potential conflicts between land uses:

Goal LU-2: Maintain and enhance the character, variety and stability of Menlo Park's residential neighborhoods.

> **Policy LU-2.3: Mixed Use Design.** Allow mixed-use projects with residential units if project design addresses potential compatibility issues such as traffic, parking, light spillover, dust, odors, and transport and use of potentially hazardous materials.

Goal LU-4: Promote the development and retention of business uses that provide goods or services needed by the community that generate benefits to the City, and avoid or minimize potential environmental and traffic impacts.

> **Policy LU-4.5: Business Uses and Environmental Impacts**. Allow modifications to business operations and structures that promote revenue generating uses for which potential environmental impacts can be mitigated.

As stated above, the Proposed Project generally is not expected to create objectionable odors to sensitive receptors and thus would not create compatibility issues related to odors, as stated in Policy LU-2.3. Specifically, the office, residential, and commercial uses associated with the Proposed Project are compatible with each other because none produce substantial objectionable odors. All cooking areas in

[54] Bay Area Air Quality Management District. 2017. *California Environmental Quality Act Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: March 15, 2022.

commercial kitchens will be covered with hoods. The exhaust from culinary uses is intended to go to the roof of the buildings and be disbursed with grease rated fans. In this case the odors dissipate before they can get back to occupied areas. For areas with low roofs or otherwise needing grease exhaust adjacent to occupied areas, the Proposed Project proposes to use a pollution control unit (PCU) to clean the air. Further, consistent with Policy LU-4.5, the Proposed Project would develop and retain business uses without creating objectionable odors. However, as stated above, odors from the pump station could adversely affect a substantial number of people, resulting in a significant impact. This feature of the Proposed Project is consistent with the goals and policies in the General Plan related to odor.

Last, BAAQMD Regulation 7 contains requirements on the discharge of odorous substances after the Air Pollution Control Officer (APCO) receives odor complaints from ten or more complainants within a 90-day period, alleging that a person has caused odors perceived at or beyond the property line of such person and deemed to be objectionable by the complainants in the normal course of their work, travel or residence [BAAQMD 7-102]. The operations within the Proposed Project would be subject to this regulation and would comply with the requirements if the regulation becomes applicable via BAAQMD 7-102, which is not expected. Therefore, the Proposed Project would be in compliance with BAAQMD Regulation 7.

The Proposed Project would implement Mitigation Measure AQ-1.4, which requires the sewer pump station to be equipped with a molecular neutralizer. With implementation of Project Mitigation Measure AQ-1.4 and compliance with BAAQMD Regulation 7, this impact would be ***less than significant with mitigation*.**

Project Mitigation Measure AQ-1.4: Molecular Neutralizer for Odors.

The Project Sponsor and West Bay Sanitary District shall install a molecular neutralizer at the proposed sanitary sewer pump station to convert hydrogen sulfide gas into a biodegradable effluent during sewer pump operations. The molecular neutralizer shall be installed prior to the commencement of sewer pump operations.

Cumulative Impacts

Impact C-AQ-1: Cumulative Air Quality Impacts. Cumulative development would result in a significant and unavoidable cumulative impact on air quality; thus, the Proposed Project would be a cumulatively considerable contributor to a significant cumulative impact on air quality. (SU)

Summary of Analysis in the ConnectMenlo EIR

As discussed in Section 4.2, *Air Quality*, of the ConnectMenlo EIR, the geographic context for cumulative impacts related to air quality is the SFBAAB. Development of past, current, and future projects within the SFBAAB had or have the potential to increase criteria air pollutants. However, the City and surrounding areas are required to comply with state and local regulations related to renewable energy, fuel efficiency, and energy-efficient building materials and construction practices.

The ConnectMenlo EIR determined that criteria air pollutant emissions generated by cumulative development would exceed BAAQMD's project-level significance thresholds and contribute to the nonattainment designations for the SFBAAB and that implementation of ConnectMenlo in combination with past, present, and reasonably foreseeable projects elsewhere within the SFBAAB would result in a significant cumulative impact with respect to air quality, even with implementation of ConnectMenlo EIR Mitigation Measures AQ-2a through AQ-3b. Therefore, the ConnectMenlo EIR determined that cumulative impacts related to criteria air pollutants under ConnectMenlo would be ***significant and unavoidable***.

Cumulative Impacts with the Proposed Project

Criteria Pollutants

Consistent with the ConnectMenlo EIR, the geographic context for cumulative air quality impacts with the Proposed Project includes the SFBAAB. As noted in Chapter 3, *Environmental Impact Analysis*, of this EIR, in addition to the buildout projections considered in the ConnectMenlo EIR, the cumulative scenario for this EIR also includes the additional unrestricted units at the 123 Independence Drive project and East Palo Alto projects. As with the Proposed Project, the 123 Independence Drive project and East Palo Alto projects, as well as other projects in the area, would be required to comply with existing local and regional plans adopted to minimize potential cumulative air quality impacts; however, some projects nonetheless could exceed criteria pollutant thresholds for pollutants for which the SFBAAB is in nonattainment status. Therefore, these additional projects would not alter the cumulative impact determination stated in the ConnectMenlo EIR, and the cumulative impact with respect to air quality would remain significant and unavoidable.

The Proposed Project would not result in a substantial change in the ConnectMenlo project and would not cause new or substantially more severe significant air quality impacts than those analyzed in the ConnectMenlo EIR. The Proposed Project, however, would be a cumulatively considerable contributor to the significant and unavoidable cumulative impact identified in the ConnectMenlo EIR. Therefore, consistent with the conclusion in the ConnectMenlo EIR, the Proposed Project in combination with other past, present, and reasonably foreseeable future projects would result in a ***significant and unavoidable cumulative impact*** with respect to criteria pollutants.

Toxic Air Contaminants and PM2.5

According to BAAQMD's CEQA Guidelines, combined risk levels should be determined for all TAC sources within 1,000 feet of a project site and compared to BAAQMD's cumulative health risk thresholds.[55]

Nearby TAC sources as well as Proposed Project's construction and operational emissions could contribute to a cumulative health risk for sensitive receptors near the Project Site. BAAQMD's inventory of stationary health risks were used to estimate the combined levels of health risk from existing stationary sources in combination with the Proposed Project. Geographic information system (GIS) raster files provided by BAAQMD were used to estimate roadway and railway emissions.[56] The methods used to estimate Proposed Project-related TAC emissions are described under Impact AQ-3 and in Appendix 3.4-1. The results of the cumulative impact assessment are summarized in Table 3.4-18. This table shows the health risk values for the Proposed Project's maximally affected receptors and the health risk contributions from existing sources. The sum of the Proposed Project's and existing background health risk results were compared to BAAQMD cumulative thresholds. Individual background contributions from existing sources are included in Appendix 3.4-1.

As shown in Tables 3.4-18 and 3.4-19, below, after implementation of Mitigation Measures AQ-1.1 and Mitigation Measures AQ-2b1 and AQ-2b2 from the ConnectMenlo EIR, the combined level of health risks from the Proposed Project and other local sources of TACs would be less than all BAAQMD-recommended cumulative health risk thresholds. Therefore, the levels of health risk associated with TACs emitted by the Proposed Project in combination with the level of health risk associated with other nearby TAC sources would not result in a significant cumulative local health risk at any nearby sensitive land uses. This impact would be ***less than significant with mitigation.***

[55] Ibid.

[56] Winkel, Jackie. Principal environmental planner, Bay Area Air Quality Management District. April 12, 2018—email to Darrin Trageser, ICF, Sacramento, CA, regarding GIS files containing data regarding background health risks from railroads, major roads, and highway sources within BAAQMD jurisdiction.

Table 3.4-18. Maximum Mitigated Cumulative Health Risks (onsite)

Source	Maximum Affected Onsite Receptor		
	Cancer Risk (per million)[a]	Non-Cancer Chronic Hazard Index[b]	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Contribution from Existing Sources			
Stationary	0.1	< 0.01	0.03
Roadways	0.2	< 0.01	0.01
Highways	9.1	—	0.19
Major Streets	3.9	—	0.08
Rail	2.4	—	< 0.01
Existing Total	15.7	< 0.01	0.31
Contribution from Project			
Project Construction	7.2	0.01	0.04
Project Operations	2.5	< 0.01	0.09
Existing + Construction + Operations	**25**	**0.02**	**0.44**
BAAQMD Cumulative Thresholds	100	10.0	0.8
Exceeds Thresholds?	**No**	**No**	**No**

See Appendix 3.4-2 for detailed modeling files.
Totals may not add up because of rounding.
Notes:
$\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 or less
a. Maximum cumulative cancer risk.
b. Data were not available for chronic values for roadway and rail sources.

Table 3.4-19. Maximum Mitigated Cumulative Health Risks (offsite)

Source	Maximum Affected Offsite Receptor		
	Cancer Risk (per million)[a]	Non-Cancer Chronic Hazard Index[b]	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Contribution from Existing Sources			
Stationary	0.01	< 0.01	< 0.01
Roadways	1.3	< 0.01	0.20
Highways	8.0	—	0.21
Major Streets	2.1	—	0.09
Rail	2.5	—	< 0.01
Existing Total	13.9	< 0.01	0.50
Contribution from Project			
Project Construction	7.6	0.01	0.06
Project Operations	1.5	< 0.01	0.12
Existing + Construction + Operations	**23**	**0.01**	**0.68**
BAAQMD Cumulative Thresholds	100	10.0	0.8
Exceeds Thresholds?	**No**	**No**	**No**

See Appendix 3.4-2 for detailed modeling files.
Totals may not add up because of rounding.
Notes:
$\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 or less
[a] Maximum cumulative cancer risk.
[b] Data were not available for chronic values for roadway and rail sources.

Odors

As described in Impact AQ-4, after implementation of Mitigation Measure AQ-1.4, the odor impact from the Proposed Project would be less significant. Since other projects in the vicinity would not include odor-generating uses according to BAAQMD's CEQA Guidelines, the level of odors emitted by the Proposed Project in combination with the level of odors associated with other nearby projects would not result in a significant cumulative odor impact. This impact would be ***less than significant with mitigation***.