4.2 AIR QUALITY

4.2.1 INTRODUCTION

This section presents existing air quality conditions in the project area (including the project site, the applicable air district jurisdiction, and the air basin), provides a description of the regulatory framework for air quality management on a federal, state, regional, and local level, and analyzes the potential air quality impacts, both temporary (i.e., construction) and long term (i.e., operational), from the implementation of the proposed Scott Ranch project. It also presents potential impacts to air quality from the construction and operation of a proposed regional park trail that would extend from the western boundary of the Scott Ranch project site to the existing Ridge Trail on Helen Putnam Regional Park (see **Section 4.2.4.4** below).

4.2.2 ENVIRONMENTAL SETTING

4.2.2.1 Climate and Topography

The project site is located within the Petaluma Valley, which is part of a subregion that stretches from the City of Santa Rosa to the San Pablo Bay, and is often considered as two different valleys (the Cotati Valley in the north and the Petaluma Valley in the south). To the east, the valley is bordered by the Sonoma Mountains, while to the west is a series of low hills, followed by the Estero Lowlands, which open to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay is known as the Petaluma Gap. This low-terrain area allows marine air to travel into the Bay Area. Wind patterns in the Petaluma and Cotati Valleys are strongly influenced by the Petaluma Gap, with winds flowing predominantly to the east (City of Petaluma 2008).

Air temperatures are very similar in the two valleys. Summer maximum temperatures for this subregion are in the high 70s to low 80s, while winter maximum temperatures are in the high 50s to low 60s. Summer minimum temperatures are approximately 50 degrees Fahrenheit, and winter minimum temperatures are in the high 30s (Western Regional Climate Center 2016).

Generally, air pollution potential is low in the Petaluma Valley because of its link to the Petaluma Gap and because of its low population density. However, there are two scenarios that can result in elevated pollutant levels: 1) stagnant conditions in the morning hours created when a weak ocean breeze meets a weak bay breeze, and 2) an eastern or southeastern wind pattern in the afternoon which brings in pollution from the Carquinez Strait Region and the Central Valley (City of Petaluma 2008).

4.2.2.2 Regional Air Quality

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to national and state standards. Health-based air quality standards have been established by the State of California and the federal government for the following criteria[1] air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter less than 10 microns in diameter (PM10), fine particulate matter less than 2.5 microns in diameter (PM2.5), and lead (Pb). These standards were established with a margin of safety to protect sensitive receptors from adverse health impacts due to exposure to air pollution. The state and national ambient air quality standards for each of the monitored pollutants and their effects on health are summarized in **Table 4.2-1, Ambient Air Quality Standards**. The "primary" standards have been established to protect the public health. The "secondary" standards (which are the same as the primary standards for O_3, NO_2, PM10 and PM2.5) are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects. California standards are generally the same or more stringent than federal standards.

Air quality of a region is considered to be in attainment of the National Ambient Air Quality Standards (NAAQS) if the measured ambient air pollutant levels are not exceeded more than once per year, except for O_3, PM10, PM2.5, which are based on annual averages or arithmetic mean. The NAAQS for O_3, PM10, and PM2.5 are based on statistical calculations over one- to three-year periods, depending on the pollutant.

The project site is located in the southern portion of the City of Petaluma in Sonoma County. The City is located within the nine-county San Francisco Bay Area Air Basin (SFBAAB or Air Basin), which encompasses seven counties (Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa) and portions of two others (southwestern Solano and southern Sonoma). The air quality within the Air Basin is influenced by a wide range of emissions sources, such as dense population centers, heavy vehicular traffic, and industry. The SFBAAB is currently designated as a marginal nonattainment area with respect to the national standard for 8-hour O_3, a nonattainment area for 24-hour PM2.5, and is designated as attainment or unclassifiable for all other pollutants. Additional details regarding the attainment status are provided later in this section.

[1] "Criteria" pollutants are air pollutants for which the US EPA has established air quality standards. They are so named because the US EPA periodically publishes criteria documents to help establish the federal air quality standards.

Table 4.2-1
Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standards	National Standards[1]		Health and Other Effects
			Primary[2,3]	Secondary[2,4]	
Ozone (O_3)	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Same as primary	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage
	1-hour	0.09 ppm (180 µg/m^3)	--[5]	--	
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	--	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	--	
Nitrogen Dioxide (NO_2)[6]	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration
	1-hour	0.18 ppm (339 µg/m^3)	0.100 ppm[6] (188 µg/m^3)	--	
Sulfur Dioxide (SO_2)	Annual	--	--[7]	--	
	24-hour	0.04 ppm (105 µg/m^3)	--[7]	--	
	3-hour	--	--	0.5 ppm (1300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm[7] (196 µg/m^3)	--	Bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma

Air Pollutant	Averaging Time	California Standards	National Standards[1]		Health and Other Effects
			Primary[2,3]	Secondary[2,4]	
Respirable Particulate Matter (PM10)	Annual	20 μg/m³	--	--	a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
	24-hour	50 μg/m³	150 μg/m³	Same as primary	
	Annual	12 μg/m³	12 μg/m³	--	
Fine Particulate Matter (PM2.5)	24-hour	No separate state standard	35 μg/m³	--	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
Lead	Calendar Quarter	--	1.5 μg/m³	Same as primary	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction
	30-day Average	1.5 μg/m³	--	--	

Source: California Air Resources Board. 2016. Available online at: https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed October 10, 2019.

ppm = parts per million by volume; μg/m³ = microgram per cubic meter; mg/m³ = milligrams per cubic meter.

1 *Standards, other than for ozone, particulate matter, and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.*

2 *Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.*

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

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

5 *The national 1-hour ozone standard was revoked by US EPA on June 15, 2005. A new 8-hour standard was established in 2015.*

6 *The form of the 1-hour NO_2 standard is the 3-year average of the 98th percentile of the daily maximum 1-hour average concentration.*

7 *On June 2, 2010 the US EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of the 1-hour daily maximum. The US EPA also revoked both the existing 24-hour and annual average SO_2 standards.*

The SFBAAB is currently designated as a nonattainment area with respect to the state standards for O_3, PM10, and PM2.5 and is designated as attainment or unclassified for all other pollutants. Additional details regarding the attainment status are provided later in this section.

Air quality in the SFBAAB is affected by the pollutants generated by dense population centers, heavy vehicular traffic, and industry. However, as mentioned above, coastal sea breezes tend to transport pollutants generated within the SFBAAB to inland locations such as the Central Valley. The air pollutants within the SFBAAB are generated by two categories of sources: stationary and mobile. Stationary sources comprise "point sources," which have one or more emission sources at a single facility, or "area sources," which are widely distributed and produce many small emissions. Point sources are usually associated with manufacturing and industrial uses and include sources such as refinery boilers or combustion equipment that produce electricity or process heat. Examples of area sources include residential water heaters, painting operations, lawn mowers, agricultural fields, landfills, and consumer products, such as barbecue lighter fluid or hair spray. "Mobile sources" refer to operational and evaporative emissions from on- and off-road motor vehicles.

4.2.2.3 Local Air Quality

The Bay Area Air Quality Management District (BAAQMD) operates more than 30 air-quality monitoring stations throughout the SFBAAB to measure ambient concentrations of the criteria pollutants. The nearest monitoring station to the project site is located at the Sebastopol 103 Morris Street monitoring station. **Table 4.2-2, Ambient Pollutant Concentrations Measured Nearest the Project Site**, provides a summary of air pollutant monitoring data for this station. This table shows the highest air pollutant concentrations measured at the station over the three-year period from 2016 through 2018. As PM10 is not monitored at the Sebastopol 103 Morris Street Station, data for PM10 was obtained from the Guerneville at Church and 1st Streets monitoring station.

Traffic congestion along roadways and at intersections used to have the potential to generate localized high levels of CO. Although high traffic volumes and congestion still have the potential to generate high levels of CO, recent years have seen less and less instances of exceedances of CO due to more efficient vehicle motors and reduced emissions. It is very unlikely for CO exceedances to occur from normal traffic operations. The BAAQMD monitoring stations have not recorded any exceedances of the state or federal CO standards since 1991.

Table 4.2-2
Ambient Pollutant Concentrations Measured Nearest the Project Site

Pollutant	Standards [1]	Year 2016	2017	2018
OZONE (O_3)				
Maximum 1-hour concentration (ppm)		0.073	0.087	0.071
Maximum 8-hour concentration (ppm)		0.065	0.072	0.053
Number of days exceeding state 1-hour standard	0.09 ppm	0	0	0
Number of days exceeding state 8-hour standard	0.070 ppm	0	1	0
Number of days exceeding federal 8-hour standard	0.070 ppm	0	1	0
NITROGEN DIOXIDE (NO_2)				
Maximum 1-hour concentration (ppm)		0.031	0.034	0.065
Annual average concentration (ppm)		4	4	4
Number of days exceeding state 1-hour standard	0.18 ppm	0	0	0
CARBON MONOXIDE (CO)[3]				
Maximum 1-hour concentration (ppm)[2]		1.6	2.1	1.4
Maximum 8-hour concentration (ppm)[2]		1.0	1.6	1.3
Number of days exceeding state 8-hour standard	9.0 ppm	0	0	0
Number of days exceeding federal 8-hour standard	9 ppm	0	0	0
SULFUR DIOXIDE (SO_2)[3]				
Maximum 1-hour concentration in ppm		N/A	N/A	N/A
Maximum 24-hour concentration in ppm		N/A	N/A	N/A
Number of days exceeding state 1-hour standard	0.25 ppm	N/A	N/A	N/A
Number of days exceeding state 24-hour standard	0.04 ppm	N/A	N/A	N/A
PARTICULATE MATTER (PM_{10}) [4]				
Maximum 24-hour concentration, state ($\mu g/m^3$)		45.0	106.1	234.3
Maximum 24-hour concentration, federal ($\mu g/m^3$)		43.2	102.3	216.4
Annual arithmetic mean concentration ($\mu g/m^3$)		N/A	15.4	16.6
Number of samples exceeding state 24-hour standard	50 $\mu g/m^3$	0	7	13
Number of samples exceeding federal 24-hour standard	150 $\mu g/m^3$	0	0	2
PARTICULATE MATTER ($PM_{2.5}$)				
Maximum 24-hour concentration ($\mu g/m^3$)		18.7	81.8	175.3
Annual arithmetic mean concentration ($\mu g/m^3$)		4.6	8.0	8.3
Number of samples exceeding federal 24-hour standard	35 $\mu g/m^3$	0	4	13

N/A = not available.

Source: California Air Resources Board, "iADAM Air Quality Data Statistics," http://www.arb.ca.gov/adam/welcome.html.Accessed October 1, 2019. Data from the Sebastopol monitoring station.

[1] *Parts by volume per million of air (ppm), micrograms per cubic meter of air ($\mu g/m^3$), or annual arithmetic mean (aam).*

[2] *Data was obtained from the BAAQMD's Annual Bay Area Air Quality Summaries from 2016 through 2018 (http://www.baaqmd.gov/about-air-quality/air-quality-summaries). Accessed October 1, 2019. Data from the Sebastopol 103 Morris Street station.*

[3] *Sulfur dioxide and carbon monoxide are not reported at nearby monitoring stations but is unlikely to exceed state standards.*

[4] *Data was used from the Guerneville at Church and 1st Streets monitoring station.*

4.2.2.4 Sensitive Receptors

There are groups of people more affected by air pollution than others. The California Air Resources Board (CARB) has identified the following population groups who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The closest sensitive receptors to the project site include single-family homes to the north in The Summit above Petaluma subdivision, to the northwest in the Victoria subdivision, and to the east of D Street in the Pinnacle Heights subdivision.

4.2.3 REGULATORY CONSIDERATIONS

Air quality within the SFBAAB is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly as well as individually to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies primarily responsible for improving the air quality within the SFBAAB are discussed below along with their individual responsibilities.

4.2.3.1 United States Environmental Protection Agency

Criteria Pollutants

The US EPA is responsible for enforcing the federal Clean Air Act (CAA) and the NAAQS. The NAAQS identify concentrations for seven criteria pollutants that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare. The seven criteria pollutants are O_3, CO, NO_2, SO_2, PM10, PM2.5, and lead. The federal ambient air quality standards and the health effects of the criteria pollutants are summarized above in **Table 4.2-1, Ambient Air Quality Standards**.

The SFBAAB is currently classified by the US EPA as a nonattainment area for the 8-hour standard for O_3 and a nonattainment area for PM2.5. Additionally, it has been designated as an attainment/unclassifiable area for the 1-hour and 8-hour standards for CO and the annual standard for NO_2, and as an attainment area for the quarterly lead standard and 24-hour and annual SO_2 standards. The SFBAAB is currently designated as unclassifiable for the 24-hour PM10 standard. In response to its enforcement responsibilities, the US EPA requires each state to prepare and submit a State Implementation Plan (SIP) describing how the state will achieve the federal standards by specified dates, depending on the severity of air pollution within the state or air basin. The BAAQMD has the responsibility for implementing many of the CAA

requirements for the region, which includes the location of the proposed project. The status of the SFBAAB with respect to attainment with the NAAQS is summarized in **Table 4.2-3, National Ambient Air Quality Standard Designations – San Francisco Bay Area Air Basin**.

Table 4.2-3
National Ambient Air Quality Standard Designations – San Francisco Bay Area Air Basin

Pollutant	Designation/Classification
Ozone (O_3)	Nonattainment
Carbon Monoxide (CO)	Unclassified/Attainment
Nitrogen Dioxide (NO_2)	Unclassified/Attainment
Sulfur Dioxide (SO_2)	Unclassified/Attainment
Respirable Particulate Matter (PM10)	Unclassified
Fine Particulate Matter (PM2.5)	Nonattainment
Lead (Pb)	Unclassified/Attainment

Source: California Air Resources Board, "Area Designations Maps/State and National," http://www.arb.ca.gov/desig/adm/adm.htm. 2018. Accessed April 4, 2019; U.S. Environmental Protection Agency, "Air Quality Maps," http://www.epa.gov/region9/air/maps /index.html. Accessed April 4, 2019.

Hazardous Air Pollutants

Regulation of hazardous air pollutants (HAPs) under federal regulations is achieved through federal and state controls on individual sources. Federal law defines HAPs as non-criteria air pollutants with short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects. The 1990 federal CAA Amendments offer a comprehensive plan for achieving significant reductions in both mobile and stationary source emissions of HAPs. Under the 1990 CAA Amendments, a total of 189 chemicals or chemical families were designated HAPs because of their adverse human health effects. Title III of the 1990 federal CAA Amendments amended Section 112 of the CAA to replace the former program with an entirely new technology-based program. Under Title III, the US EPA must establish maximum achievable control technology emission standards for all new and existing "major" stationary sources through promulgation of National Emission Standards for Hazardous Air Pollutants (NESHAP). Major stationary sources of HAPs are required to obtain an operating permit from the BAAQMD pursuant to Title V of the 1990 CAA Amendments. A major source is defined as one that emits at least 10 tons per year of any HAP or at least 25 tons per year of all HAPs. The proposed project would not be considered a major source.

4.2.3.2 California Air Resources Board (CARB)

CARB, a branch of the California Environmental Protection Agency (CalEPA), oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1988 California Clean Air Act (CCAA), for responding to the federal CAA requirements, and for regulating emissions from motor vehicles and consumer products within the state. The CCAA and other California air quality statutes designate local air districts, such as the BAAQMD, with the responsibility for regulating most stationary sources, and to a certain extent, area sources.

Criteria Air Pollutants

Like the US EPA, CARB has established ambient air quality standards for the state (i.e., California Ambient Air Quality Standards [CAAQS]). These standards apply to the same seven criteria pollutants as the federal CAA and also address sulfates (SO_4), visibility-reducing particles, hydrogen sulfide (H_2S) and vinyl chloride (C_2H_3Cl). The CCAA standards are more stringent than the federal standards and, in the case of PM10 and SO_2, far more stringent. Based on monitored pollutant levels, the CCAA divides O_3 nonattainment areas into four categories (moderate, serious, severe, and extreme) to which progressively more stringent planning and emission control requirements apply.

The SFBAAB is a nonattainment area for the California 1-hour and 8-hour ozone standard. The SFBAAB is designated as nonattainment for the California 24-hour and annual PM10 standards, as well as the California annual PM2.5 standard. The SFBAAB is designated as attainment or unclassifiable for all other CAAQS. The ozone precursors (reactive organic gases [ROG], and oxides of nitrogen [NO_X]), in addition to PM10, are the pollutants of concern for projects located in the SFBAAB. The status of the SFBAAB with respect to attainment with the CAAQS is summarized in **Table 4.2-4, California Ambient Air Quality Standard Designations – San Francisco Bay Area Air Basin**.

Table 4.2-4
California Ambient Air Quality Standard Designations – San Francisco Bay Area Air Basin

Pollutant	Designation/Classification
Ozone (O_3)	Nonattainment
Carbon Monoxide (CO)	Attainment
Nitrogen Dioxide (NO_2)	Attainment
Sulfur Dioxide (SO_2)	Attainment
Respirable Particulate Matter (PM10)	Nonattainment
Fine Particulate Matter (PM2.5)	Nonattainment
Lead (Pb)	Attainment
Sulfates (SO_4)	Attainment
Hydrogen Sulfide (H_2S)	Unclassified

Pollutant	Designation/Classification
Vinyl Chloride	Unclassified
Visibility Reducing Particles	Unclassified

Source: California Air Resources Board, "Area Designations Maps/State and National," http://www.arb.ca.gov/desig/adm/adm.htm. Accessed April 4, 2019.

Toxic Air Contaminants

California law defines toxic air contaminants (TACs) as air pollutants having carcinogenic or other health effects. A total of 245 substances have been designated TACs under California law; they include the federal HAPs adopted as TACs in accordance with Assembly Bill 2728. The Air Toxics Hot Spots Information and Assessment Act of 1987, Assembly Bill 2588 (AB 2588), seeks to identify and evaluate risk from TAC sources; AB 2588 does not regulate TAC emissions directly. Under AB 2588, sources emitting more than 10 tons per year of any criteria air pollutant must estimate and report their TAC emissions to the local air districts. Local air districts then prioritize facilities on the basis of emissions, and high priority facilities are required to submit a health risk assessment and communicate the results to the affected public. Depending on risk levels, emitting facilities are required to implement varying levels of risk reduction measures. The BAAQMD is responsible for implementing AB 2588 in the SFBAAB.

The BAAQMD is currently working to control TAC impacts from local hot spots and from ambient background concentrations. The control strategy involves reviewing new sources to ensure compliance with required emission controls and limits, maintaining an inventory of existing sources to identify major TAC emissions, and developing measures to reduce TAC emissions. The BAAQMD publishes the results of the various control programs in an annual report, which provides information on the current TAC inventory, AB 2588 risk assessments, TAC monitoring programs, and TAC control measures and plans.

One of the TACs being controlled by the BAAQMD is particulate matter from diesel-fueled engines, also known as diesel particulate matter (DPM). Compared to other TACs, DPM emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk in the SFBAAB. On a statewide basis, the average potential cancer risk associated with these emissions is over 500 potential cancer cases per million exposed persons. In addition to these general risks, DPM emissions can also indicate elevated localized or near-source exposures.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides

from existing on-road heavy-duty diesel fueled vehicles. The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

4.2.3.3 Bay Area Air Quality Management District

Management of air quality in the SFBAAB is the responsibility of the BAAQMD. The BAAQMD is responsible for bringing and/or maintaining air quality in the SFBAAB within federal and state air quality standards. Specifically, the BAAQMD has responsibility for monitoring ambient air pollutant levels throughout the SFBAAB and developing and implementing attainment strategies to ensure that future emissions will be within federal and state standards. The following plans have been developed by the BAAQMD to achieve attainment of the federal and state ozone standards.

Clean Air Plans

The Clean Air Plan (CAP) was developed as an integrated control strategy to reduce ozone, particulate matter, TACs, and greenhouse gases. The California CAA requires air districts within nonattainment areas to prepare triennial assessments and revisions to their CAPs. The BAAQMD has prepared a series of CAPs, the most recent of which was adopted in April of 2017 (BAAQMD 2017b). The 2017 CAP continues the air pollution reduction strategy established by the 1991 CAP and represents the fifth triennial update to the 1991 CAP, following previous updates of 1994, 1997, 2000, and 2010. The 2017 CAP is designed to address attainment of the state standard for ozone, particulate matter, air toxics, and greenhouse gases. CAPs are intended to focus on the near-term actions through amendments of existing regulations and promulgation of new District regulations.

The Bay Area 2017 CAP provides a comprehensive plan to improve Bay Area air quality and protect public health. The 2017 CAP defines a control strategy that the District and its partners will implement to: (1) reduce emissions and decrease ambient concentrations of harmful pollutants; (2) safeguard public health by reducing exposure to air pollutants that poses the greatest health risk, with an emphasis on protecting the communities most heavily impacted by air pollution; and (3) reduce greenhouse gas emissions to protect the climate. State law required the CAP to include all feasible measures to reduce emissions of ozone precursors and to reduce transport of ozone precursors to neighboring air basins.

BAAQMD Rules and Regulations

Specific rules and regulations have been adopted by the BAAQMD that limit emissions that can be generated by various uses and/or activities. These rules regulate not only the emissions of the state and

federal criteria pollutants, but also the emissions of TACs. The rules are also subject to ongoing refinement by the BAAQMD.

In general, all stationary sources with air emissions are subject to the BAAQMD's rules governing their operational emissions. Some emission sources are further subject to regulation through the BAAQMD's permitting process. Through this permitting process, the BAAQMD also monitors the amount of emissions being generated by stationary sources and uses this information in developing the CAP. A few of the primary BAAQMD rules applicable to the proposed project include the following:

Regulation 8, Rule 3 (Architectural Coatings): This rule sets limits on the ROG content in architectural coatings sold, supplied, offered for sale, or manufactured within the BAAQMD's jurisdiction. The rule also includes time schedules that specify when more stringent ROG standards are to be enforced. The rule applies during the construction phase of a project. In addition, any periodic architectural coating maintenance operations are required to comply with this rule.

Regulation 8, Rule 15 (Emulsified and Liquid Asphalts): This rule sets limits on the ROG content in emulsified and liquid asphalt used for maintenance and paving operations. The rule includes specific ROG content requirements for various types of asphalt (e.g., emulsified asphalt, rapid-cure liquid asphalt, slow-cure liquid asphalt). This rule applies during the construction phase of a project. In addition, any future asphalt maintenance of a project's roads would be required to comply with the ROG standards set in Rule 15.

Regulation 9, Rule 6 (Nitrogen Oxide Emission from Natural Gas-Fired Water Heaters): This rule sets a limit on the NO_x emissions from natural gas-fired water heaters. The rule applies to natural gas-fired water heaters manufactured after July 1, 1992 with a heat input rating of less than 75,000 BTU/hour. Water heaters subject to the rule must not emit more than 40 nanograms of NO_x per joule of heat output.

Regulation 9, Rule 7 (Nitrogen Oxide and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters): This rule limits the NO_x and CO emissions from industrial, institutional, and commercial boilers, steam generators, and process heaters. The rule applies to boilers with a heat input rating greater than 10 million BTU/hour fired exclusively with natural gas, liquefied petroleum gas, or a combination or boilers with a heat input rating greater than 1 million BTU/hour fired with other fuels.

Regulation 9, Rule 8 (Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines): This rule limits the NO_x and CO emissions from stationary internal combustion engines. The rule applies to engines rated at greater than 50 brake horsepower, but it exempts emergency generators that would not run for more than 100 hours per year.

BAAQMD CEQA Guidelines

On June 2, 2010, the BAAQMD's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under the California Environmental Quality Act (CEQA). These thresholds were designed to establish the level at which the Air District believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on the Air District's website and included in the Air District's 2012 *CEQA Air Quality Guidelines*. The thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the thresholds were upheld. However, in an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards. The Supreme Court also found that CEQA requires the analysis of exposing people to environmental hazards in specific circumstances, including the location of development near airports, schools, near sources of toxic contamination, and certain exemptions for infill and workforce housing. The Supreme Court also held that public agencies remain free to conduct this analysis regardless of whether it is required by CEQA.

In view of the Supreme Court's opinion, local agencies may rely on BAAQMD thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about a project. However, these thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts.

The BAAQMD recently published a new version of the guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion (BAAQMD 2017a). The Air District is currently working to update any outdated information in the guidelines.

4.2.3.4 Local Plans and Policies

City of Petaluma General Plan 2025

The City of Petaluma General Plan 2025 contains goals and policies relating to air quality (criteria air pollutants and toxic air contaminants). General Plan goals and policies relevant to the proposed project are as follows:

Chapter 4: The Natural Environment

Policy 4-P-6: Improve air quality through required planting of trees along streets and within park and urban separators, and retaining tree and plant resources along the river and creek corridors.

A. Require planting of trees for every significant tree removed at a project site. Replacement planting may occur on the project site or on a publicly owned area, with long-term maintenance assured.

- Encourage the use of trees which provide biogenic benefits to air quality and are suitable to the local environment.

Policy 4-P-7: Reduce motor vehicle related air pollution.

A. Enforce land use and transportation strategies described in Chapter 1: Land Use and Chapter 5: Mobility that promote use of alternatives to the automobile for transportation, including walking, bicycling, bus transit, and carpooling.

Policy 4-P-15: Improve air quality by reducing emissions from stationary point sources of air pollution (e.g. equipment at commercial and industrial facilities) and stationary area sources (e.g. wood-burning fireplaces and gas-powered lawn mowers) which cumulatively emit large quantities of emissions.

A. Continue to work with the Bay Area Air Quality Management District to achieve emissions reductions for nonattainment pollutants; including carbon monoxide, ozone, and PM-10, by implementation of air pollution control measures as required by State and federal statutes.

B. Continue to use Petaluma's development review process and the California Environmental Quality Act (CEQA) regulations to evaluate and mitigate the local and cumulative effects of new development on air quality.

C. Continue to require development projects to abide by the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines.

D. Reduce emissions from residential and commercial uses by requiring the following:

- Use of high efficiency heating and other appliances, such as cooking equipment, refrigerators, and furnaces, and low NOx water heaters in new and existing residential units;

- Compliance with or exceed requirements of CCR Title 24 for new residential and commercial buildings;
- Incorporation of passive solar building design and landscaping conducive to passive solar energy use for both residential and commercial uses, i.e., building orientation in a south to southeast direction, encourage planting of deciduous trees on west sides of structures, landscaping with drought resistant species, and use of groundcovers rather than pavement to reduce heat reflection;
- Encourage the use of battery-powered, electric, or other similar equipment that does not impact local air quality for nonresidential maintenance activities;
- Provide natural gas hookups to fireplaces or require residential use of EPA-certified wood stoves, pellet stoves, or fireplace inserts.

Policy 4-P-16: To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall encourage the inclusion in construction contracts of the following requirements or measures shown to be equally effective:

- Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction;
- Minimize idling time of construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment;
- Use alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline);
- Use add-on control devices such as diesel oxidation catalysts or particulate filters;
- Use diesel equipment that meets ARB's 2000 or newer certification standard for off-road heavy-duty diesel engines;
- Phase construction of the project;
- Limit the hours of operation of heavy-duty equipment.

City of Petaluma Implementing Zoning Ordinance

In 2008, the City of Petaluma adopted the Implementing Zoning Ordinance (IZO) in order to provide consistency between the General Plan 2025 and the City's zoning regulations. The IZO includes zoning

districts, development standards, and uses consistent with the General Plan 2025. By classifying and regulating the land uses in the City, the IZO implements the goals and policies of the General Plan 2025.

City of Petaluma Municipal Code

The Petaluma Municipal Code regulates air quality and odors.

21.040 – Dangerous and Objectionable Elements

C. Odors. No emission shall be permitted of odorous gases or other odorous matter in such quantities as to be readily detectable when diluted in the ratio of one volume of odorous air to four volumes of clean air at the points of measurement specified in Section 21.120(B) or at the point of greatest concentration. Any process which may involve the creation or emission of any odors shall be provided with a secondary safeguard system, so that control will be maintained if the primary safeguard system should fail. There is hereby established as a guide in determining such quantities of offensive odors Table III, "Odor Thresholds", in Chapter 5, "Air Pollution Abatement Manual", copyright 1959, by Manufacturing Chemists' Association, Inc., Washington, D.C., and said manual, and/or table as subsequently amended.

H. Smoke, Fumes, Gases, Dust, Particulate Matter. No emission shall be permitted at any point which would violate the current regulation for such emission as established by the San Francisco Bay Area Air Pollution Control District.

4.2.4 IMPACTS AND MITIGATION MEASURES

4.2.4.1 Significance Criteria

For the purposes of this Draft EIR, air quality impacts of the proposed project would be considered significant if they would exceed the following Standards of Significance, which are based on Appendix G of the *State CEQA Guidelines* and the BAAQMD *CEQA Air Quality Guidelines*. According to these guidelines, a project would normally have a significant impact on air quality if it would:

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

Construction Emissions

Impacts related to construction emissions associated with the proposed project would be considered significant if the construction emissions exceeded the thresholds listed in **Table 4.2-5, BAAQMD Average Daily Construction Emission Thresholds**.

Table 4.2-5
BAAQMD Average Daily Construction Emission Thresholds

Criteria Air Pollutants	Average Daily Emissions (Pounds per Day)
ROG	54
NOx	54
PM10 (Exhaust)	82
PM2.5 (Exhaust)	54

Source: BAAQMD, 2017a

Operational Emissions

Impacts from direct and/or indirect operational emissions associated with the proposed project would be considered significant if they exceeded the daily or the annual emissions thresholds in **Table 4.2-6, BAAQMD Operational Emission Thresholds**.

Table 4.2-6
BAAQMD Operational Emission Thresholds

Criteria Air Pollutants	Average Daily Emissions (Pounds per Day)	Maximum Annual Emissions (Tons per Year)
ROG	54	10
NOx	54	10
PM10	82	15
PM2.5	54	10

Source: BAAQMD, 2017a

Direct emissions are those that are emitted on a site and include emissions from stationary sources and on-site mobile equipment. Examples of land uses and activities that generate direct emissions are industrial operations and sources subject to an operating permit by the BAAQMD. Indirect emissions come from mobile sources that access the project site, but generally are emitted off-site. For many types of land

development projects, the principal source of air pollutant emissions is the motor vehicle trips generated by the project.

Toxic Air Contaminant Emissions

Single Source Impact Thresholds[2]

If project emissions of TACs or PM2.5,[3] within a zone of influence of 1,000 feet from the project site boundary, during construction or project operation cause an existing sensitive receptor to be exposed to levels that exceed any of the thresholds of significance listed below, the proposed project would result in a significant impact and mitigation would be required.

- An excess cancer risk level of more than 10 in 1 million.
- A non-cancer (chronic or acute) hazard index greater than 1.0.
- An incremental increase of more than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average PM2.5.

Odors

For impacts associated with odors, the BAAQMD considers project operations that result in five confirmed complaints per year averaged over three years to have a significant impact.

Local Carbon Monoxide Concentrations

The impact associated with a project's indirect CO emissions is considered significant if the emissions will contribute to a violation of the state standards for CO (9.0 ppm averaged over 8 hours and 20 ppm over 1 hour).

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2 The BAAQMD *CEQA Air Quality Guidelines* also include cumulative source impact thresholds, and provide that a project would have a cumulatively considerable impact if the aggregate total of human health risks from all past, present, and foreseeable future sources within a 1,000-foot radius of the fence line of a source or from the location of a receptor, plus the contribution from the project, exceeds the following thresholds: (1) an excess cancer risk level of more than 100 in 1 million; (2) chronic non-cancer hazard index (from all local sources) greater than 10.0; or 0.8 μg/m3 annual average PM2.5. There are no other construction projects within 1,000 feet of the fence line of the proposed project. Therefore a cumulative construction-phase TAC impact is not analyzed in this Draft EIR.

3 One of the TACs being controlled by the BAAQMD is particulate matter from diesel-fueled engines, also known as diesel particulate matter (DPM). Compared to other TACs, DPM emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk in the Basin. DPM is emitted in equipment and vehicle exhaust in the form of PM2.5 emissions. The BAAQMD *CEQA Air Quality Guidelines* therefore include a concentration-based threshold for PM2.5 emitted during construction and operation of a proposed project.

4.2.4.2 Methodology

Construction Emissions of Criteria Pollutants

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to predict emissions from the construction of the proposed project. Average daily emissions from project construction were calculated, including both on-site and off-site activities. On-site activities would consist of the operation of off-road construction equipment, as well as on-site truck travel (e.g., haul trucks, water trucks, dump trucks, and concrete trucks), whereas off-site sources would be emissions from construction hauling truck, vendor truck, and worker vehicle trips. For more information on model inputs and assumptions, see **Impact AIR-1** below.

Operational Emissions of Criteria Pollutants[4]

CalEEMod, which was used to estimate the project's construction emissions, also provided estimates of the project's operational emissions of criteria pollutants which are reported in **Impact AIR-1** below.

Operational CO Impact

The BAAQMD recommends CO modeling for a plan or a project if the addition of project traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. No intersections affected by the proposed project would handle more than 44,000 vehicles per hour, as such no CO modeling is required for this project. See **Impact AIR-3** below.

Community Health Risk Impacts

The methodology used to assess community health risk impacts from exposure to TAC emissions is described under **Impact AIR-3**.

4 In the *CEQA Air Quality Guidelines*, the BAAQMD put forth a screening methodology that sets forth the types and sizes of land development projects that would be expected to result in less than significant air quality impacts. For operational air emissions, the screening project size is identified at 325 single-family homes. The proposed project would construct 66 single-family homes, and therefore based on the BAAQMD's screening criteria, would not be expected to generate operational emissions that would result in significant air quality impacts and quantification of operational emissions is not required. However, the screening methodology was not used in this Revised Draft EIR and CalEEMod was used to estimate the operational air emissions.

4.2.4.3 Project Impacts and Mitigation Measures

Impact AIR-1: The proposed project would not conflict with or obstruct implementation of the applicable air quality plan. (*Less than Significant*)

An air quality plan refers to clean air plans, state implementation plans (SIPS), ozone plans, and other potential air quality plans developed by the BAAQMD. The most recent clean air plan applicable to the proposed project is the *2017 Clean Air Plan: Spare the Air and Cool the Climate* that was adopted by the BAAQMD in April 2017. BAAQMD 2017 *CEQA Air Quality Guidelines* provide guidance for addressing consistency with the clean air plan in General Plans and Specific Plans (i.e., not projects).

As noted above, the CAP defines a control strategy in order to: (1) reduce emissions and decrease ambient concentrations of harmful pollutants; (2) safeguard public health by reducing exposure to air pollutants that poses the greatest health risk, with an emphasis on protecting the communities most heavily impacts by air pollution; and (3) reduce greenhouse gas emissions to protect the climate. According to BAAQMD CEQA Guidelines, any project that does not support the goals of the CAP would be considered inconsistent with the CAP. In order to demonstrate consistency with these goals, BAAQMD recommends that the project show consistency with the CEQA thresholds of significance. The proposed project would not conflict with the latest Clean Air planning efforts since the project would result in operational emissions below the BAAQMD thresholds (see **Impact AIR-2**). As the emissions from the project would not exceed any of the significance thresholds, the proposed project is not required to incorporate project-specific transportation control measures listed in the latest Clean Air Plan. Therefore, the proposed project would not conflict with the Clean Air Plan nor obstruct its implementation. The impact would be less than significant.

Mitigation Measures: No mitigation measures are required.

Impact AIR-2: Construction and operation of the proposed project would generate emissions that would result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable

federal or state ambient air quality standard. (*Significant; Less than Significant with Mitigation*)

Construction Phase Emissions

Construction activities associated with the proposed project would result in short-term emissions of criteria pollutants, such as ROG, NO_x, PM10, and PM2.5, from the operation of construction equipment and vehicles and emissions of fugitive dust during demolition, site excavation, utility trenching, grading, and construction. Estimated construction emissions are presented below and evaluated for their potential to result in a significant impact on air quality.

Davidon (28-Lot) Residential Project Component

The overall construction duration of the Davidon (28-Lot) Residential Project component would last approximately 30 months. Site clearing, grading, and trenching for the Davidon (28-Lot) Residential Project component is anticipated to last for nine months and the construction for the remaining phases of the Davidon (28-Lot) Residential Project component is anticipated to last an additional 21 months. As described in **Section 3.0, Project Description**, grading activity would require 112,000 cubic yards of cut and 112,000 cubic yards of fill. All soil is anticipated to be balanced on site. In order to model emissions, the CalEEMod defaults were used for each phase of construction, with the exception of the trenching phase for which CalEEMod does not have default equipment. For this phase, the analysis relied on the equipment modeled in the air quality analysis of the 2013 EIR prepared for substantial larger residential development at the project site, see air modeling output files in Appendix 4.2. This provides a conservative analysis as the most recent iteration of the proposed project is less than half the size of the development at the project site, analyzed in the 2013 EIR.

Putnam Park Extension Project Component

The Putnam Park Extension Project component is anticipated to be constructed in three phases, as described in **Section 3.0, Project Description**. Construction of Phase 1 would last approximately three to four months overlapping with the last months of construction of the Davidon (28-Lot) Residential Project component. Phase 2 and Phase 3 construction is anticipated to last six to nine months and three to four months, respectively. However, the timing and implementation of Phases 2 and 3 depends on the availability of funding and priorities of the Sonoma County Regional Parks upon transfer of title to Regional Parks. Therefore, in order to provide a conservative estimate of the emissions, CalEEMod modeling was prepared for Phase 1 and these emissions were added to the model prepared for the Davidon (28-Lot) Residential Project component in order to account for the overlap in phases. Since the timing of Phase 2 and Phase 3 is unknown at this time, emissions from the two phases were modeled assuming construction of these phases

would occur simultaneously and directly after the completion of Phase 1, see air modeling output files in Appendix 4.2. This represents the most conservative approach for assessing emission impacts of these phases.

Estimated Criteria Air Pollutant Emissions

Table 4.2-7, Construction Period Criteria Air Pollutant Emissions, presents the total construction emissions, which are the sum of annual emissions over the entire construction period of both project components, and the average daily construction emissions for ROG, NO_x, PM10 (exhaust), and PM2.5 (exhaust). As indicated in **Table 4.2-7**, estimated average daily project construction emissions would not exceed the thresholds for ROG, NO_x, PM10 (vehicle exhaust), or PM2.5 (vehicle exhaust).

Table 4.2-7
Construction Period Criteria Air Pollutant Emissions

Scenario	ROG	NOx	PM10	PM2.5
Davidon (28-Lot) Residential Project Component				
2020	0.16	2.72	0.14	0.14
2021	0.12	1.89	0.11	0.11
2022	1.35	0.69	0.04	0.04
Putnam Park Extension Project Component (Phase 1)				
2022	0.08	0.55	0.03	0.04
Total (tons)[1]	1.71	5.84	0.32	0.33
Davidon (28-Lot) Residential Project Component and Phase 1				
Average Daily Emissions (lbs/day)[2]	3.75	12.82	0.70	0.72
BAAQMD Thresholds (in lbs)	*54*	*54*	*82*	*54*
Exceed Threshold?	***No***	***No***	***No***	***No***
Putnam Park Extension Project Component (Phase 2 and 3)				
2022	0.17	1.1	0.05	0.05
Total (tons)	0.17	1.1	0.05	0.05
Average Daily Emissions (lbs/day)[2]	1.89	12.22	0.56	0.56
BAAQMD Thresholds (in lbs.)	*54*	*54*	*82*	*54*
Exceed Threshold?	***No***	***No***	***No***	***No***

Source: Impact Sciences, 2019. See Appendix 4.2.
[1] Total includes emissions from Davidon (28-Lot) Residential Project component and Putnam Park Extension Project component Phase 1 as construction would overlap.
[2] Assumes ~911 workdays for Davidon (28-Lot) Residential Project component and Putnam Park Extension Project component Phase 1 and 180 workdays for Putnam Park Extension Project component (Phase 2 and 3)
All emissions are reported as "unmitigated".
PM10 and PM2.5 totals are for exhaust.

As shown in **Table 4.2-7**, emissions resulting from construction of the proposed project would not exceed the BAAQMD's significance thresholds for ROG, NOx, PM10 (exhaust), and PM2.5 (exhaust). Moreover, in the event that construction of Phase 2 and 3 of the Putnam Park Extension Project component occur at the same time as Phase 1 and the Davidon (28-Lot) Residential Project component, ROG emissions would be approximately 5.64 pounds per day (lbs/day), NOx would be approximately 25.07 lbs/day, PM10 (exhaust) would be approximately 1.26 lbs/day, and PM2.5 (exhaust) would be approximately 1.28 lbs/day. Therefore, should all phases of construction occur simultaneously, emissions would continue to be less than significant.

Fugitive Dust Emissions

Construction activities, particularly during site preparation, utility trenching, and grading, would temporarily generate fugitive dust, including PM10 and PM2.5 emissions. Sources of fugitive dust would include disturbed soils at the construction site during grading and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. Fugitive dust emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. Fugitive dust emissions would also depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. The *CEQA Air Quality Guidelines* consider the impact from a project's construction-phase dust emissions to be less than significant if best management practices listed in the guidelines are implemented. Without these BMPs, the impact from fugitive dust emissions would be potentially significant. **Mitigation Measure AIR-2** requires implementation of dust control and other BMPs put forth by the BAAQMD, which would reduce potential impacts from fugitive dust emissions to a less than significant level.

Operational Emissions

To analyze operational emissions with respect to BAAQMD thresholds, criteria air pollutant emissions during project operation were estimated with CalEEMod. The model analysis assumed a total of 322 vehicle trips per day (during weekdays) generated by the Davidon (28-Lot) Residential Project component as quantified in the traffic analysis (see **Section 4.13, Transportation**). Additionally, the analysis assumed a total of 62 trips per day generated by the Putnam Park Extension Project component on the weekends (Saturday and Sunday) based on the Institute of Transportation Engineers 10th edition. Default trip rates were used for the weekday park and weekend residential trips (**Section 4.13, Transportation**).

Estimated Criteria Air Pollutant Emissions during Operations

Table 4.2-8, Operational Criteria Air Pollutant Emissions, presents the total operational emissions which are the sum of annual emissions over the first year of operation and the average daily emissions for ROG, NO_x, PM10 (vehicle exhaust), and PM2.5 (vehicle exhaust) from project operation. As presented in **Table 4.2-8**, estimated annual emissions and average daily project-operation emissions would not exceed the thresholds for ROG, NO_x, PM10 (vehicle exhaust), or PM2.5 (vehicle exhaust). Therefore, the proposed project's operational emissions would not contribute substantially to an existing or projected violation of the NAAQS or CAAQS and the proposed project would not require evaluating impacts from the emissions of ozone precursors and particulate matter (PM10 and PM2.5)— the pollutants for which the SFBAAB is in nonattainment.

Table 4.2-8
Operational Criteria Pollutant Emissions

	Estimated Emissions			
Emissions Source	**ROG**	**NOx**	**PM10[b]**	**PM2.5[b]**
Davidon (28-Lot) Residential Project Component	0.55	0.43	0.02	0.02
Putnam Park Extension Project Component (Phase 1)	0.02	0.03	0.0002	0.0002
Putnam Park Extension Project Component (Phases 2 and 3)	0.034	0.05	0.0004	0.0004
Total (tons)	0.604	0.51	0.021	0.021
Annual Thresholds (tons)	*10*	*10*	*15*	*10*
Exceeds Thresholds?	***No***	***No***	***No***	***No***
Average Daily Emissions (lbs/day)	3.31	2.79	0.11	0.11
Daily Thresholds (in lbs.)[a]	*54*	*54*	*82*	*54*
Exceeds Thresholds?	***No***	***No***	***No***	***No***

Source: CalEEMod data, Impact Sciences, 2019. See Appendix 4.2.
[a] - Assumes 365-day operation.
[b] - PM10 and PM2.5 totals are for exhaust.

Mitigation Measures:

AIR-2 The construction contractor(s) shall implement the following measures during construction:

a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

b. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

c. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

d. All vehicle speeds on unpaved roads shall be limited to 15 mph.

e. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

h. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after Mitigation: Implementation of these BAAQMD-recommended dust control measures would reduce the project's construction impact to a less than significant level.

Impact AIR-3: Construction and operation of the proposed project would expose sensitive receptors to substantial pollutant concentrations. *(Significant; Less than Significant with Mitigation*)

Project construction activities and vehicular traffic generated by project operations would have the potential to expose sensitive receptors to substantial pollutant concentrations.

To provide a conservative analysis of the potential health risk of the proposed project, this analysis is based on using a health risk analysis prepared for the substantially larger project of 66 single-family home units previously proposed at the project site (66 single-family homes HRA). Calculation details of the 66 single-

family home HRA are provided in **Appendix 4.2**. Review of the surrounding land uses demonstrates that the sensitive receptors near the project site have not changed since the preparation of the 66 single-family home HRA. Additionally, as noted in **Section 3.0, Project Description**, diesel-powered off-road equipment used during construction of the proposed project would be selected to minimize emissions and meet U.S. EPA particulate matter emissions standards for Tier 3 engines or equivalent. Therefore, with the substantial reduction in the number of residences and the use of Tier 3 engines, the level of pollutants concentration under the proposed project are anticipated to be much lower than emissions associated with the construction of 66 single-family homes at the project site. As such, the analysis prepared in the previous HRA to calculate potential exposure of sensitive receptors to pollutants concentrations, from the of 66 single-family homes at the project site, was used to conservatively assess the level of exposure to pollutants concentrations that would result from the proposed project.

The discussion below provides a summary of the previous HRA which is provided in **Appendix 4.2**. A relative estimate of the exposure to pollutant concentrations under the proposed project is then presented.

Exposure to Pollutant Concentrations during Construction

The BAAQMD *CEQA Air Quality Guidelines* recommend modeling of fine particulate matter (PM2.5) concentrations if sensitive receptors (which are defined as residences, day care centers, schools and elderly care facilities) are present within 1,000 feet of a construction site to determine whether nearby receptors could be exposed to substantial concentrations of DPM, resulting in community health risk impacts. The nearest sensitive receptors to the project site are the residents located approximately 50 feet from the project site within the Victoria Subdivision to the northwest and The Summit above Petaluma subdivision to the north. Additional nearby residences within the Pinnacle Heights Subdivision are located across D Street approximately 300 feet east of the project site.

The previous HRA calculated on-site DPM emissions through the CalEEMod model, assuming construction would occur over a 3.5-year period (2017-2020) and determined that the project would emit 0.673 tons of PM2.5 exhaust. Based on the emission estimates of PM2.5 exhaust, the previous HRA estimated the concentrations of DPM and PM2.5 at the nearby sensitive receptors using the U.S. Environmental Protection Agency's (EPA) ISCST3 dispersion model in order to calculate the concentration of DPM at each sensitive receptor (see **Appendix 4.2**). The health risk posed to the nearest sensitive receptor was then calculated in accordance with the Office of Environmental Health and Hazard Association's (OEHHA) 2015 guidance (OEHHA 2015). Results of this assessment, as shown in **Table 4.2-9, Maximum Community Risks from Project Construction Activities, Previous HRA Findings,** indicate that the maximum residential lifetime excess cancer risk would be 33.1 in 1 million for an infant exposure and 0.9 in one million for an adult exposure. The maximum lifetime excess cancer risk for the development at the

project site analyzed in the previous HRA was found to be above the BAAQMD significance threshold with cancer risk of 10 in one million or greater, and would be considered a significant impact unless mitigated.

The maximum modeled annual PM2.5 concentration, including fugitive dust and DPM, was found to be 0.244 μg/m^3 in the previous HRA, occurring adjacent to the residence where the maximum increased cancer risk from construction would occur. This PM2.5 concentration was found to be below the BAAQMD significance threshold of an incremental increase of 0.3 μg/m^3 used to evaluate the significance of health impacts from PM2.5. This would be considered a less-than-significant impact. The maximum computed hazard index (HI) identified in the 2017 Draft EIR's DPM concentration was found to be 0.019, which is lower than the BAAQMD's significance criteria.

Table 4.2-9
Maximum Community Risks from Project Construction Activities, Previous HRA Findings

Receptor	Lifetime Excess Cancer Risk (per million)	Annual PM2.5 (μg/m^3)*	Hazard Index
Infant	33.1	0.244	0.019
Significance Threshold	10	0.3	1.0
Exceeds Threshold?	***Yes***	***No***	***No***

Source: Atmospheric Dynamics, 2016. See Appendix 4.2.
**The annual PM2.5 concentration is the sum of the DPM and fugitive PM2.5 concentrations.*

As noted above, the proposed project would construct fewer homes as compared to the development evaluated in the previous HRA, resulting in less DPM emissions over a shorter construction duration. As stated in **Impact AIR-2**, construction of the Davidon (28-Lot) Residential Project component would occur over 30 months. According to the CalEEMod modeling for the proposed project, construction is anticipated to emit a total of 0.365 tons of PM2.5 exhaust emissions.[5]

The ISCST3 dispersion model used in the previous HRA calculated a concentration of pollutant at the Maximum Exposed Individual (MEI) for each year of construction, see **Appendix 4.2**. To calculate the risk posed to the MEI as a result of the proposed project, the ISCST3 model would have the same meteorological inputs and sensitive receptor locations, the only input that would change is the emission rate of the pollutant due to the updated construction intensity and duration. As stated above, the proposed project would construct and operate 28 single-family homes. Comparing the previous HRA's CalEEMod modeling

5 On-site exhaust PM2.5 emissions from Davidon (28-Lot) Residential Project component and Putnam Park Extension Project component Phases 1,2, and 3 assuming that construction of all phases would occur simultaneously in order to provide the most conservative analysis.

results for PM2.5 exhaust emissions against the modeling for the proposed project, the PM2.5 exhaust emissions would be reduced by approximately 54 percent. Since the only difference within the ISCST3 model is the emission rate, this would imply that the health risk itself would also decrease by approximately 54 percent. Therefore, the construction of the proposed project would result in an infant health risk of approximately 15.2 in one million (54 percent decrease of 33.1 in one million), which is above the BAAQMD significance criterion of 10 in one million.

Table 4.2-10
Maximum Community Risks from Project Construction Activities, Updated Project

Receptor	Lifetime Excess Cancer Risk (per million)
Infant	15.2
Significance Threshold	10
Exceeds Threshold?	***Yes***

The estimated cancer risk is a conservative estimate as the Davidon (28-Lot) Residential Project component of the proposed project would be constructed over a period of 30 months instead of 3 years, so the MEI would be exposed to construction-related DPM for a shorter length of time.

In the event that some portions of the proposed project are developed first and occupied by residents and other project portions are constructed later, the on-site receptors could be exposed to TAC and PM2.5 emissions from the construction activities associated with the subsequent phases. The impact to on-site receptors would be comparable to the impacts identified above for existing off-site receptors due to the geography of the project site and the distances between construction areas and the nearest on-site receptors. This impact would be potentially significant. Project construction would expose nearby sensitive receptors to substantial concentrations of TACs, resulting in a significant community health risk impact unless mitigated.

As shown above, the proposed project would result in significant health risk impact during construction. **Mitigation Measures AIR-2,** would control fugitive dust and on-site construction exhaust emissions and reduce the impact with respect to community health risk caused by project construction activities to a less-than-significant level.

Exposure to Pollutant Concentrations during Project Operation

Operation of the Davidon (28-Lot) Residential Project component would not generate harmful levels of TAC or PM2.5 emissions on the project site that could affect the health of the community near the project site, because the proposed project does not include any stationary sources of TAC emissions and the vast majority of the vehicles associated with the proposed project would operate on gasoline and not diesel, which is the primary source of TACs and PM2.5. There would be minimal human health risk impact from operation of the proposed project and the project would also not contribute to any cumulative human health risk impact.

CO emitted by project traffic is the criteria pollutant that would have the potential to result in substantial pollutant concentrations. Congested intersections with a large volume of traffic have the greatest potential to cause high, localized concentrations of CO. CO levels have been at healthy levels (i.e., below state and federal standards) in the Bay Area since the early 1990s and, as a result, the area is designated as attainment for CO. As stated above, the BAAQMD recommends CO modeling if project traffic would increase total traffic at any given intersection to 44,000 vehicles per hour. As described in **Section 4.13, Transportation**, cumulative traffic volumes at all intersections affected by the project would be less than 44,000 vehicles per hour. Therefore, the project will not result in the violation of the CO standards and would not expose sensitive receptors to substantial CO concentrations. The impact would be less than significant.

In summary, project operation would not result in the exposure of sensitive receptors to substantial pollutant concentrations.

Significance after Mitigation Measure AIR-2 which includes best management practices for controlling fugitive PM10 and PM2.5 emissions would reduce exhaust emissions by 5 percent and fugitive dust emissions by over 50 percent. With implementation of this measure, the computed maximum increased residential infant cancer risk for construction would decrease to 9.1 in one million for the project analyzed in the previous HRA. The health risk would be below the BAAQMD threshold of greater than 10 per one million for cancer risk. Therefore, since the previously analyzed HRA captures the emissions from a larger project, the proposed project would also be reduced to below the BAAQMD's thresholds as the proposed project would incorporate the same measures and involve the construction of less homes over a shorter duration of construction than was analyzed in the 2017 Draft EIR's health risk analysis. Therefore, with the implementation of **Mitigation Measure AIR-2**, the project would have a less than significant impact with respect to community risk caused by construction activities.

Impact AIR-4: **The proposed project would not result in other emissions (such as leading to odors) adversely affecting a substantial number of people. (*Less than Significant*)**

The proposed project would have the potential to result in localized diesel exhaust emissions from the operation of construction equipment and truck activity during the construction period. As diesel exhaust has an associated odor, these emissions may be noticeable from time to time to adjacent receptors. However, they would be temporary, short-term, and localized and are not likely to result in confirmed odor complaints. Furthermore, Tier 3 construction equipment would be utilized to minimize diesel exhaust emissions emitted on the project site during construction. The odor impact from construction-phase emissions would be less than significant. The proposed project does not include any land uses that could subject existing receptors in the project vicinity to substantial odors.

There are no sources of substantial odors near the project site that could subject the new residents of the site to substantial odors. There would be no impact on the new residents related to exposure to odors.

Mitigation Measures: No mitigation measures are required.

4.2.4.4 Regional Park Trail Impacts and Mitigation Measures

Environmental Setting

The proposed regional park trail alignment would be located within the SFBAAB. The nearest sensitive receptors to the regional park trail alignment are residential uses along Oxford Court located more than 300 feet to the north. There are currently no emissions sources on-site.

Impacts and Mitigation Measures

RPT Impact AIR-1: **Construction of the proposed regional park trail project would result in a cumulatively considerable net increase of a criteria pollutant for which the project region is non-attainment under an applicable national or state ambient air quality standard, expose existing sensitive receptors to substantial pollutant concentrations, create objectionable odors, or conflict with or obstruct implementation of the applicable air quality plan, but construction-phase emissions of fugitive dust could exceed applicable thresholds.** (***Significant; Less than Significant with Mitigation***)

Criteria Pollutants

As discussed in **Section 3.0, Project Description**, the proposed regional park trail would be approximately 0.5 mile long and four feet wide, which is the standard width for trails. Trail construction would disturb approximately 0.25 acre of land and would require the removal of overhanging vegetation and branches as well as low lying saplings, weeds, and brush along the trail length. Mature trees would not be removed as part of trail construction. Some grading may be required to create a shelf for the trail depending on the hillside slope and to achieve trail slopes that are usable. Trail dozers may be used for initial grading and excavation. Small construction equipment such as power wheel barrows and bob cats would be used to haul spoils from the trail construction site, if necessary. The final trail construction would be done by hand. The trail would be composed of compacted earth with gravel used only where needed to provide stability. Exposed soil in the construction area would be seeded. Due to the small scale of construction for the regional park trail project and limited pieces of equipment that would be used to construct the trail, the impact associated with construction emissions of criteria pollutants would be less than significant. However, as with any construction activity, fugitive dust would be generated and if not mitigated by the implementation of BAAQMD-recommended measures, the impact would be considered significant. **Mitigation Measure RPT AIR-1** requires implementation of dust control and other BMPs put forth by the BAAQMD, which would reduce potential impact from fugitive dust emissions to a less than significant level.

A small increase in vehicle trips to Helen Putnam Regional Park may occur due to operation of the proposed regional park trail. The expansion would install a 0.5-mile segment of trail, which is relatively small as compared to the existing 6-mile trail network within the Helen Putnam Regional Park. Thus, trail operation would not create a significant increase in the emissions of any criteria pollutant and operational air quality impacts of the trail would be less than significant.

Air Quality Standards

Construction activities associated with the proposed regional park trail and its operation would result in emissions that would not exceed the significance thresholds adopted by the BAAQMD for evaluating impacts from the emissions of ozone precursors, the pollutant for which the SFBAAB is in nonattainment. With respect to PM10 and PM2.5, **Mitigation Measure RPT AIR-1** would be implemented to control fugitive dust and minimize exhaust emissions. Therefore, with mitigation, the proposed regional park trail project would not contribute substantially to an existing or projected violation of the NAAQS or CAAQS. The impact would be less than significant.

Toxic Air Contaminants

As mentioned above, the proposed regional park trail would require minimal construction activities and due to the small scale of the project and limited pieces of equipment, the construction impact associated with TAC emissions would be less than significant. Trail operation would not create an increase in the emissions of any TAC.

Odors

Construction of the proposed regional park trail could require the use of diesel-fueled equipment, which has an associated odor. However, odors would be short term and temporary and would disperse rapidly. They would not be pervasive enough to affect a substantial number of people or to be objectionable. Consequently, construction of the proposed regional park trail would not cause or be affected by odors, and the impact would be less than significant. Furthermore, **Mitigation Measure RPT AIR-1** would be implemented to minimize diesel exhaust emissions emitted on the trail site during construction. The proposed regional park trail project does not include any land uses that could subject existing receptors in the project vicinity to substantial odors.

Conflict with an Air Quality Plan

The proposed regional park trail would not conflict with or obstruct the implementation of the Bay Area Clean Air Plan since the regional park trail project would result in minimal operational emissions. The impact would be less than significant.

Mitigation Measures:

RPT AIR-1 The construction contractor(s) shall implement the following measures during construction:

a. All exposed surfaces (e.g., staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

b. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

c. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

d. All vehicle speeds on unpaved roads shall be limited to 15 mph.

e. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]).

f. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

g. A publicly visible sign shall be posted with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after Mitigation: Implementation of these BAAQMD-recommended dust control measures would reduce the trail project's construction-phase impact to a less than significant level.

4.2.4.5 Cumulative Impacts and Mitigation Measures

The geographical cumulative context for the evaluation of cumulative air quality impacts is the SFBAAB. This cumulative study area was selected because all project-related emissions would occur within this air basin.

Cumulative Impact AIR-1: **The proposed project and the proposed regional park trail, in conjunction with other past, present and reasonably foreseeable future development, would not result in significant cumulative air quality impacts. (*Less than Significant*)**

According to the BAAQMD's *CEQA Air Quality Guidelines*, project emissions that do not exceed the BAAQMD emission thresholds would not have a significant cumulative impact. The mass-based significance thresholds published by the BAAQMD are designed to ensure compliance with both NAAQS and CAAQS and are based on an inventory of projected emissions in the SFBAAB. As these are based on the projected growth in the SFBAAB, if a project is estimated to result in emissions that do not exceed the thresholds, the project's contribution to the cumulative impact on air quality would not be substantial. As shown in **Impact AIR-2**, the construction and operational emissions associated with the proposed project would not exceed applicable significance thresholds for criteria pollutants. Therefore, the project would not result in a significant cumulative air quality impact related to criteria pollutants.

As noted above, construction of the proposed project with the implementation of mitigation would not result in cancer risk or noncarcinogenic health risk that would cumulate with the health risk impacts from construction projects because no other projects would be under construction within 1,000 feet of the project site. With respect to cumulative human health impacts from project operations, neither the Scott Ranch project nor the regional park trail project include any sources of substantial TAC emissions and thus would not contribute to a cumulative human health risk.

Based on this analysis, the proposed project and the regional park trail project would result in a less than significant cumulative impact on air quality.

Mitigation Measures: No mitigation measures are required.

4.2.5 REFERENCES

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