East Bay Municipal Utility District

# Wildcat Pumping Plant Project
# Final Air Quality Technical Report

**June 2021**

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PANORAMA
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# Final Air Quality Technical Report

**June 2021**

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# 1 Introduction

## 1.1 Project Overview

The East Bay Municipal Utility District (EBMUD) is proposing to construct a new Wildcat Pumping Plant (PP) at EBMUD's existing Road 20 Rate Control Station (RCS) site in the City of San Pablo in Contra Costa County (Figure 1 and Figure 2). The Wildcat PP would replace the existing Road 20 Portable PP (approximately 10-million-gallon-per-day [mgd] capacity). The Wildcat PP Project (project) is necessary to improve the reliability of water service to major portions of the Aqueduct Pressure Zone (PZ) and to provide transmission capacity south from the Sobrante Water Treatment Plant (WTP) during Orinda WTP, Claremont Tunnel, and Wildcat Aqueduct planned and unplanned outages that could occur due to maintenance and inspection or emergency shutdowns. Although the existing Road 20 PP and San Pablo WTP have been providing service in the event of outages, the Road 20 PP is a temporary facility that cannot meet all the demands in the Aqueduct PZ and upper cascades, and the San Pablo WTP is an aging facility that is planned to be decommissioned. The project will also allow EBMUD to distribute water that is stored in San Pablo Reservoir and treated at Sobrante WTP to EBMUD's West of Hills service area, particularly in drought years.

The project includes the following primary components:

- Construction of a new 25-mgd Wildcat PP (shown on Figure 3) at the existing Road 20 RCS site at the intersection of El Portal Drive and Road 20 in the City of San Pablo;
- Replacement of a 4-inch slow-venting air valve near 1303 Walnut Street in the City of Berkeley and installation of a new 2-inch slow-venting air valve at Crockett PP, west of San Pablo Avenue at Robert Miller Drive in the City of San Pablo;
- Construction of an onsite stormwater drainage system that would connect to a new manhole and storm drain pipeline on El Portal Drive, which would extend westerly for approximately 725 feet before connecting to an existing curb inlet on the south side of Road 20; and
- Construction of approximately 170 feet of new 36-inch-diameter suction and discharge pipelines, which would be installed on site to connect the new Wildcat PP to the existing Wildcat Aqueduct.

The Wildcat PP would consist of four approximately 8-mgd variable frequency drive pumps (for a total capacity of 25 mgd) and associated mechanical and electrical equipment located inside an approximately 40-foot-wide, 80-foot-long, and 24-foot-tall building. The site will be enclosed by an eight-foot-high, black-vinyl coated security chain link fence on all sides with the exception of the south and southeastern sides where an eight-foot-high concrete masonry unit (CMU) wall topped with barbed wires will be installed in place of the chain link fence. The Wildcat PP would include an approximate 25-foot-tall antenna (from the ground floor), outdoor light fixtures; site access double swing gates; a parking area; outdoor transformer and switchgear; auto-transfer switch; generator control panel; and staging areas for a temporary emergency generator, portable diesel tank, and portable pumps. The existing Road 20 PP will be removed from the project site after the project is constructed; however, the existing portable pump connections will remain for emergencies and unplanned outages of the Wildcat PP. The project would also include building architectural and landscape treatments, as well as stormwater bioretention features, as described in the *East Bay Municipal Utility District Wildcat Pumping Plant Project Aesthetics Conceptual Design Report* (Panorama Environmental, Inc., MWA Architects, and Dillingham Associates, 2021).

**Figure 1 Regional Location**

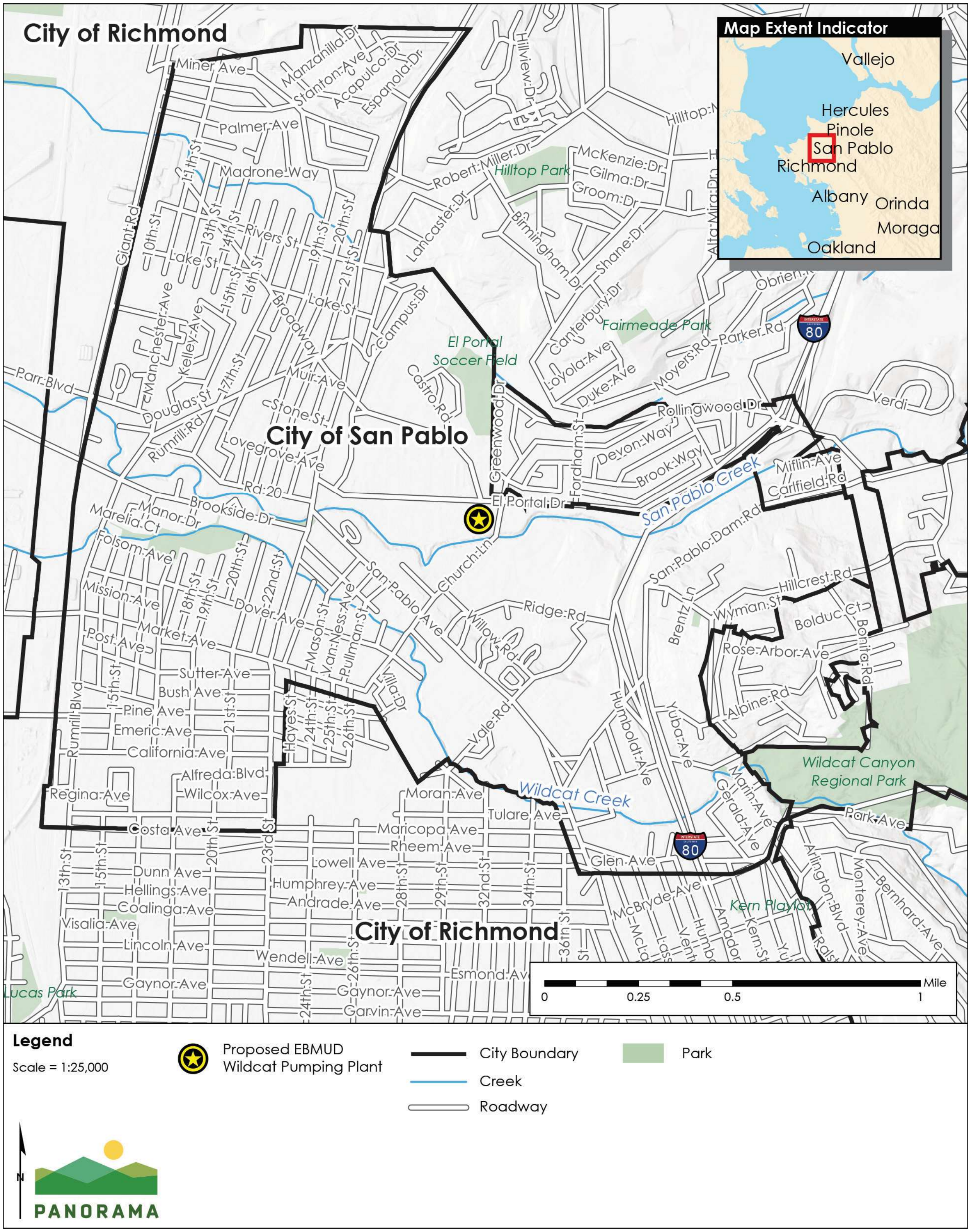
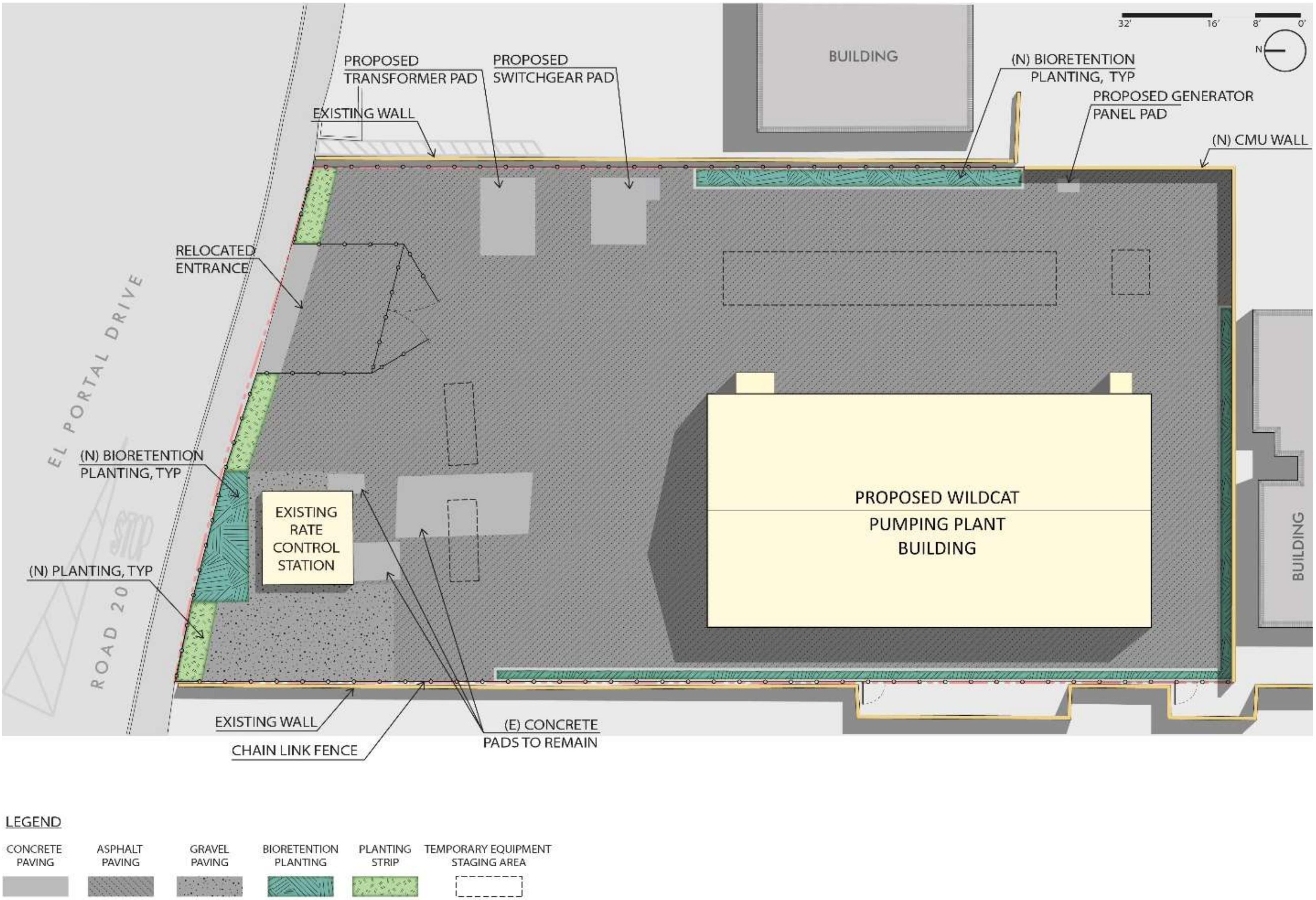


**Figure 2 Wildcat Pumping Plant Site and Road 20 Storm Drain Pipeline Alignment**

**Figure 3 Wildcat Pumping Plant Site Plan**




*Source: (EBMUD, 2021)*

## 1.2 Definitions

### 1.2.1 Ozone

Ground-level ozone ($O_3$) forms through the reaction of pollutants emitted by industrial facilities, electric utilities, and motor vehicles. Chemicals that are precursors to ozone formation can also be emitted by natural sources. Ground-level ozone can pose risks to human health, in contrast to the stratospheric ozone layer that protects the earth from harmful wavelengths of solar ultraviolet radiation. Short-term exposure to ground-level ozone can cause a variety of respiratory health effects, including inflammation of the lining of the lungs, reduced lung function, and respiratory symptoms such as cough, wheezing, chest pain, burning in the chest, and shortness of breath.

### 1.2.2 Particulate Matter

Particulate matter (PM) is a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles (liquid droplets or solids) over a wide range of sizes. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less ($PM_{10}$) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$).

### 1.2.3 Carbon Monoxide

Carbon monoxide (CO) is created from the incomplete combustion of fuels. Gasoline-fueled vehicles and other on-road and non-road mobile sources are the primary sources of CO. Exposure to carbon monoxide reduces the capacity of the blood to carry oxygen, thereby decreasing the supply of oxygen to tissues and organs such as the heart.

### 1.2.4 Lead

Lead (Pb) is a toxic metal that can accumulate in bones, blood, and soft tissues of the body. The major source of lead emissions to the air was combustion of leaded gasoline in motor vehicles (such as cars and trucks). Following the elimination of leaded gasoline in the United States by the mid-1990s, the remaining sources of lead air emissions have been industrial sources, including lead smelting and battery recycling operations, and piston-engine small aircraft that use leaded aviation gasoline.

### 1.2.5 Nitrogen Oxides

Nitrogen oxides (NOx) are pollutants that include the various forms of nitrogen combined with oxygen, including nitric oxide (NO) and nitrogen dioxide ($NO_2$). $NO_X$ are emitted from the burning of fuels by cars, trucks, buses, power plants, and non-road engines and equipment. Exposure to $NO_2$ has been associated with a variety of health effects, including respiratory symptoms, especially among asthmatic children, and respiratory-related emergency department visits and hospital admissions, particularly for children and older adults.

### 1.2.6 Sulfur Oxides

Sulfur oxides ($SO_X$) are pollutants that include the various forms of sulfur combined with oxygen, including sulfur dioxide ($SO_2$). $SO_X$ are emitted from the burning of fossil fuel combustion by electrical utilities and industry. Studies have linked short-term $SO_2$ exposures to increased respiratory symptoms in children, especially those with asthma or chronic respiratory symptoms. Short-term exposures to $SO_2$ have also been associated with respiratory-related emergency department visits and hospital admissions, particularly for children and older adults.

### 1.2.7 Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere and include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and fluorinated gases such as hydrofluorocarbons.

Some gases are more effective than others at making the planet warmer. Each GHG has been assigned a global warming potential (GWP) to reflect how long it remains in the atmosphere, on average, and how strongly it absorbs energy. Gases with a higher GWP absorb more energy per pound than gases with a lower GWP. GHGs with high GWPs (known as Super GHGs) include $CH_4$ and $N_2O$.

### 1.2.8 Emissions Model

Various computer programs may be used to calculate air emissions and emissions rates. Standard modeling programs include, but are not limited to, the California Emissions Estimator Model (CalEEMod version 2016.3.2), EMission FACtors (EMFAC), and Roadway Construction Emissions Model (RCEM). These computer programs are discussed further in Section 4.1.1.

### 1.2.9 Dispersion Model

A dispersion model is a computer program that estimates the ambient concentration of a pollutant at a given location once its emissions rate is estimated. The United States Environmental Protection Agency's (U.S. EPA) AERMOD is an example of a typically used dispersion model and is discussed further in Section 4.1.3.

### 1.2.10 Health Risk Assessment

A Health Risk Assessment (HRA) is a technical study that evaluates how toxic air contaminant (TAC) emissions are released from a project, how they disperse throughout the community, and how they may affect human health. Additional information on TACs is presented in Section 2.3.2. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting HRAs. The TACs typically evaluated in an HRA are diesel particulate matter (DPM), $PM_{2.5}$, and organic gases (i.e., reactive organic gases [ROG]). DPM is a carcinogen and $PM_{2.5}$ has been identified as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA).

### 1.2.11 Hazard Index

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level. The HI value represents the maximum concentration at which no adverse health effects to the respiratory system are anticipated to occur.

### 1.2.12 Maximally Exposed Individual

A maximally exposed individual (MEI) is a hypothetical individual who, because of proximity, activities, and living habits, would be exposed to the highest concentration(s) of TAC(s).

# 2 Environmental Setting

## 2.1 Climate and Meteorology

Climate and meteorology are important considerations for air quality. Local dispersion and regional transport of air pollutants directly relate to prevailing meteorology. Diurnal, seasonal, and regional air pollution patterns are controlled by a variety of meteorological factors. Wind directions and speeds, and vertical temperature structure (inversions) are the primary determinants of transport and dispersion effects.

Along coastal areas of northwestern Contra Costa County, temperatures are moderated by the San Francisco Bay, which can act as a heat source during cold weather or cool the air by evaporation during warm weather. It is generally sunnier farther inland from the coast, although partly cloudy skies are common throughout the summer. Average summer temperatures are mild overnight and moderate during the day. Winter temperatures are cool overnight and mild during the day. Higher temperatures are more common inland. Wind speeds vary throughout the county, with the strongest gusts along coastal areas of northwestern Contra Costa County, often aided by dominant westerly winds and a San Francisco Bay-breeze effect. Rainfall totals for the county average between 6 and 12 inches per year, with even higher amounts on top of Mount Diablo.

## 2.2 Air Basins

Air basins are geopolitical regional areas designated by the state of California (State) for the purpose of air quality management and air pollution control. The proposed project area is in the northwestern portion of Contra Costa County within the San Francisco Bay Area Air Basin (Air Basin). The Air Basin is located along the northern coast of California and covers roughly 5,430 square miles, encompassing several counties, including all of Contra Costa County.

## 2.3 Existing Air Quality Conditions

### 2.3.1 Air Pollutants

The U.S. EPA set National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants. The six criteria pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. CARB, a department of the California EPA (CalEPA), has established the California Ambient Air Quality Standards (CAAQS). The CAAQS and NAAQS are shown in Table 1. The federal and State ambient standards were developed independently with differing purposes and methods, although both processes attempted to set standards that would avoid health-related effects. Federal and State standards differ in some cases. California standards are generally more stringent than federal standards, which is particularly true for ozone and $PM_{10}$.

There are two types of NAAQS: primary and secondary. Primary standards are established to provide public health protection, including protecting the health of "sensitive" populations such as asthmatics and children. Secondary standards are established to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

#### Air Quality Attainment Status

Table 2 presents a summary of the air quality attainment designations by the U.S. EPA and CARB for the Air Basin. An "attainment" area is a geographic area identified to have air quality as good as or better than the ambient air quality standards. Areas with air quality that is worse than adopted air quality standards are designated as "nonattainment" areas for the relevant air pollutants. Nonattainment areas are sometimes further classified by degree (i.e., marginal, moderate, serious, severe, and extreme) or status (i.e., nonattainment-transitional). Once a nonattainment area meets the standards and additional re-designation requirements in the Clean Air Act (CAA), the area is designated as a "maintenance" area. "Unclassified" areas are those with insufficient air quality monitoring data to support a designation of attainment or nonattainment but are generally presumed to comply with the ambient air quality standard.

The Air Basin meets all ambient air quality standards except for ozone, $PM_{10}$, and $PM_{2.5}$. Ozone and $PM_{2.5}$ are the major regional air pollutants of concern in the Air Basin. Ozone is primarily a problem in the summer, and fine particle pollution is a problem in the winter.

High ozone levels are caused by the cumulative emissions of precursor pollutants, including ROG and $NO_x$, that react under certain meteorological conditions. High ozone levels aggravate respiratory and cardiovascular diseases, reduce lung function, and increase coughing and chest discomfort. Controlling the emissions of precursor pollutants is the focus of the Bay Area Air Quality Management District's (BAAQMD's) attempts to reduce ozone levels. The highest ozone levels in the San Francisco Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. Ozone in areas west of Mount Diablo in Contra Costa County, including the project site, rarely exceeds health standards because the area is adjacent to the San Francisco Bay, which tends to keep temperatures well below prime levels for ozone formation.

**Table 1 Ambient Air Quality Standards**

| Pollutant | Averaging Time | California Standards | National Standards[a] | |
|---|---|---|---|---|
| | | | Primary[b,c] | Secondary[b,d] |
| $O_3$ | 8-hour | 0.070 ppm (137 µg/m$^3$) | 0.075 ppm (147 µg/m$^3$) | — |
| | 1-hour | 0.09 ppm (180 µg/m$^3$) | —[e] | Same as primary |
| CO | 8-hour | 9.0 ppm (10 mg/m$^3$) | 9 ppm (10 mg/m$^3$) | — |
| | 1-hour | 20 ppm (23 mg/m$^3$) | 35 ppm (40 mg/m$^3$) | — |
| $NO_2$ | Annual | 0.030 ppm (57 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$) | Same as primary |
| | 1-hour | 0.18 ppm (339 µg/m$^3$) | 0.100 ppm[f] (188 µg/m$^3$) | — |
| $SO_2$ | Annual | — | —[g] | — |
| | 24-hour | 0.04 ppm (105 µg/m$^3$) | —[g] | — |
| | 3-hour | — | — | 0.5 ppm (1300 µg/m$^3$) |
| | 1-hour | 0.25 ppm (655 µg/m$^3$) | 0.075 ppm[g] (196 µg/m$^3$) | — |
| $PM_{10}$ | Annual | 20 µg/m$^3$ | — | Same as primary |
| | 24-hour | 50 µg/m$^3$ | 150 µg/m$^3$ | Same as primary |
| $PM_{2.5}$ | Annual | 12 µg/m$^3$ | 12 µg/m$^3$ | — |
| | 24-hour | — | 35 µg/m$^3$ | — |
| Pb | Calendar quarter | — | 1.5 µg/m$^3$ | Same as primary |
| | 30-day average | 1.5 µg/m$^3$ | — | — |

Notes:

ppm = parts per million

µg/m$^3$ = micrograms per cubic meter

mg/m$^3$ = milligrams per cubic meter

[a] Standards, other than for ozone 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.

[b] Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

[c] Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the U.S. EPA.

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

[e] The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005. A new 8-hour standard was established in May 2008.

[f] The form of the 1-hour $NO_2$ standard is the 3-year average of the 98$^{th}$ percentile of the daily maximum 1-hour average concentration.

[g] On June 2, 2010 the U.S. EPA established a new 1-hour $SO_2$ standard, effective August 23, 2010, which is based on the 3-year average of the annual 99$^{th}$ percentile of the 1-hour daily maximum. The U.S. EPA also revoked both the existing 24-hour and annual average $SO_2$ standards.

**Table 2 San Francisco Bay Area Air Basin Air Quality Attainment Designations**

| Pollutant | Federal Designation | State Designation |
|---|---|---|
| $O_3$ | Marginal nonattainment | Nonattainment |
| CO | Attainment | Attainment |
| $NO_2$ | Attainment | Attainment |
| $SO_2$ | Attainment | Attainment |
| Pb | Attainment | Attainment |
| $PM_{10}$ | Unclassified | Nonattainment |
| $PM_{2.5}$ | Moderate nonattainment | Nonattainment |
| Sulfates | No federal standard | Attainment |
| Hydrogen Sulfide ($H_2S$) | No federal standard | Unclassified |
| Visibility Reducing Particles | No federal standard | Unclassified |

*Sources: (CARB, 2018), (USEPA, 2015)*

Elevated concentrations of $PM_{10}$ and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children. Fine particle pollution is a concern in the San Francisco Bay region due to cool winter nights with light winds, wood smoke, and occasional pollution transport from the Livermore Valley to the east. The highest concentrations of particulates occur during winter, particularly at night due to cool temperatures, low wind speeds, low inversion layers, and high humidity (ABAG, 2017).

Existing and probable future air quality in the project area can best be inferred from examining ambient air quality measurements taken by BAAQMD at its monitoring station closest to the project area, which is the San Pablo monitoring station located approximately 1.0 mile away from the Wildcat PP site. Table 3 presents local ambient air quality monitoring data for 2015 through 2019 and compares measured pollutant concentrations with the most stringent applicable State and federal ambient air quality standards.

**Table 3 Summary of Ambient Air Quality Data from San Pablo Monitoring Station**

| Pollutant | Most Stringent Applicable Standard | Number of Days where Exceeded and Maximum Concentration Measured | | | | |
|---|---|---|---|---|---|---|
| | | 2015 | 2016 | 2017 | 2018 | 2019 |
| **$O_3$** | | | | | | |
| Number of days 1-hour standard exceeded | 0.09 ppm[a] | 0 | 0 | **3** | 0 | **1** |
| Maximum 1-hour (ppm) | | 0.084 | 0.094 | **0.104** | 0.061 | **0.103** |
| Number of days 8-hour standard exceeded | 0.07 ppm[a] | 0 | 0 | **2** | 0 | **2** |
| Maximum 8-hour (ppm) | | 0.062 | 0.061 | **0.080** | 0.052 | **0.079** |
| **$NO_2$** | | | | | | |
| Number of days 1-hour standard exceeded | | 0 | 0 | 0 | 0 | 0 |
| Maximum 1-hour (ppm) | 0.18 ppm[a] | 0.046 | 0.039 | 0.048 | 0.060 | 0.042 |
| **CO** | | | | | | |
| Number of days 1-hour standard exceeded | 20 ppm[a] | 0 | 0 | 0 | 0 | 0 |
| Maximum 1-hour (ppm) | | 2.0 | 1.7 | 2.5 | 1.9 | 1.8 |
| Number of days 8-hour standard exceeded | 9 ppm[a] | 0 | 0 | 0 | 0 | 0 |
| Maximum 8-hour (ppm) | | 1.1 | 1.0 | 1.9 | 1.7 | 0.9 |
| **$SO_2$** | | | | | | |
| Number of days 1-hour standard exceeded | 0.25 ppm[a] | 0 | 0 | 0 | 0 | 0 |
| Maximum 1-hour (ppm) | | 0.0107 | 0.0122 | 0.0083 | 0.0102 | 0.0176 |
| Number of days 24-hour standard exceeded | 0.04 ppm[a] | 0 | 0 | 0 | 0 | 0 |
| Maximum 24-hour (ppm) | | 0.0024 | 0.0029 | 0.0027 | 0.0021 | 0.0019 |
| **$PM_{10}$** | | | | | | |
| Maximum 24-hour (µg/m3) | 50 µg/m$^3$ [a,c] | 43 | 34 | **95** | **200** | 36 |
| Number of Estimated Days 24-hour standard exceeded | | 0 | 0 | **4** | **2** | 0 |
| **$PM_{2.5}$** | | | | | | |
| Maximum 24-hour (µg/m$^3$) | 35 µg/m$^3$ [b] | 33.2 | 19.5 | **71.2** | **195.4** | **35.9** |
| Number of days 24-hour standard exceeded | | 0 | 0 | **9** | **14** | **1** |
| Annual average (µg/m$^3$) | 12 µg/m$^3$ [a] | 8.9 | 8.1 | 10.8 | **12.7** | 7.8 |

Notes:
**Bold** values are in excess of applicable standard
\- indicates that no data is available
ppm = parts per million
µg/m$^3$ = micrograms per cubic meter
[a] State standard, not to be exceeded
[b] Federal standard, not to be exceeded
[c] $PM_{10}$ is only sampled every sixth to twelfth day

*Source: (BAAQMD, 2015) (BAAQMD, 2016) (BAAQMD, 2017b) (BAAQMD, 2018) (BAAQMD, 2019)*

### 2.3.2 Toxic Air Contaminants

TACs are a broad class of compounds known to have the potential to cause morbidity or mortality (i.e., have carcinogenic qualities) and include, but are not limited to, the criteria air pollutants listed above. TACs are commonly found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal levels.

**Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the San Francisco Bay Area average). According to CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles that make the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the gaseous components of diesel exhaust, such as benzene, formaldehyde, and 1,3-butadiene, are suspected or known to cause cancer in humans. The particulate portion of diesel exhaust is mainly comprised of aggregates of spherical carbon particles coated with inorganic and organic substances. The inorganic fraction primarily consists of small solid carbon. The organic fraction consists of soluble organic compounds such as aldehydes, alkanes, and alkenes, and high-molecular weight polycyclic aromatic hydrocarbon (PAH) and PAH-derivatives. Many of the PAH and PAH-derivatives have been found to be potent mutagens and carcinogens. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by CARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants programs. The most recent OEHHA risk assessment guidelines were published in February of 2015 (OEHHA, 2015). See**

Appendix A for a detailed description of the community risk modeling methodology used to develop the health risk assessment for this technical study.

CARB has adopted and implemented several regulations for stationary and mobile sources to reduce emissions of DPM. Several of the regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways, and include the solid waste collection vehicle rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations.

### 2.3.3 Odors

Land uses around the project area are primarily residential, commercial (i.e., business space and retail), and institutional (e.g., school). There are no stationary odor-producing land uses (e.g., landfills, refineries, confined animal feeding operations) in the project area.

### 2.3.4 Sensitive Receptors

Some groups of people are more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution and are classified as sensitive receptors: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of sensitive receptors include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The closest sensitive receptors to project construction activities are residences and Walter T. Helms Middle School located adjacent to where construction would occur. For the purposes of the air quality and greenhouse gas emissions analyses, all residential locations in the vicinity of project construction activities are assumed to include infants, children, and adults. Table 4 summarizes the types of sensitive receptors located within the project area.

**Table 4 Nearest Sensitive Receptor Types within the Project Area**

| Sensitive Receptor | Distance from the Edge of Construction Area to Nearest Receptor |
|---|---|
| **Pumping Plant Site** | |
| Kona Apartments (Multifamily Residential Apartment Building) | Adjacent to the Wildcat PP site; structures as close as approximately 20 feet south of the pumping plant site |
| Walter T. Helms Middle School | Adjacent to the Wildcat PP site; structures as close as approximately 50 feet west of the pumping plant site |
| Rancho San Pablo Residential Complex | Approximately 115 feet north of the pumping plant site, across El Portal Drive |
| Other Residences (numerous residences) | Occurring as close as 320 feet from the pumping plant site |
| **Road 20 Storm Drain Pipeline Alignment** | |
| Abella Residential Complex | Structures as close as approximately 60 feet north of the storm drain pipeline in Road 20 |

| | |
|---|---|
| Walter T. Helms Middle School | Structures as close as approximately 25 feet south of the storm drain pipeline in Road 20 |
| Other Residences (numerous residences) | Occurring as close as 320 feet from the storm drain pipeline in Road 20 |

# 3 Regulatory Setting

## 3.1 Federal Regulations

The U.S. EPA is responsible for enforcing the federal CAA and the 1990 amendments. The NAAQS, as previously discussed, were established by the federal CAA of 1970 and amended in 1977 and 1990. The ambient air quality standards are prescribed levels of pollutants that represent safe levels that avoid specific adverse health effects associated with each pollutant. Table 1 presents the NAAQS for the criteria air pollutants at different averaging periods.

As part of its enforcement responsibilities, the U.S. EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations, and identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs.

## 3.2 State Regulations

### 3.2.1 California Ambient Air Quality Standards

CARB oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAA requirements, and regulating emissions from motor vehicles and consumer products within the State. CARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. CARB also sets fuel specifications to further reduce vehicular emissions and develops airborne toxic control measures to reduce TACs identified under CARB regulations.

CARB is also responsible for establishing and reviewing state standards, compiling the California SIP, securing approval of the SIP from the U.S. EPA, conducting research and planning, and identifying TACs. CARB regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California’s air quality management districts, which are organized at the county or regional level.

Pursuant to the CCAA, CARB is responsible for setting CAAQS under California Health and Safety Code Section 39606. The CAAQS, which are listed in Table 1 and previously discussed, are intended to protect public health, safety, and welfare.

### 3.2.2 On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation

In 2008, CARB approved the On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation to reduce emissions of DPM and $NO_x$ from existing on-road heavy-duty diesel-fueled vehicles

(CARB, Truck and Bus Regulations, 2014). 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. The requirements are phased in over the compliance period and depend on the model year of the vehicle.

## 3.3 Local Regulations

### 3.3.1 Overview

Pursuant to California Government Code Section 53091, EBMUD, as a local agency and utility district, is not subject to building and land use zoning ordinances (such as tree ordinances) for projects involving facilities for the production, generation, storage, treatment, or transmission of water. However, EBMUD's practice is to work with local jurisdictions and neighboring communities during project planning, and to consider local environmental protection policies for guidance.

### 3.3.2 Bay Area Air Quality Management District Regulations

BAAQMD is the regional agency responsible for air quality regulations within the Air Basin. BAAQMD regulates air quality through its planning and review activities. BAAQMD has permit authority over most types of stationary emission sources, can require stationary sources to obtain permits, and can impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. BAAQMD regulates new or expanding stationary sources of toxic air contaminants.

Because the region is designated nonattainment for both the 1- and 8-hour State ozone standards, and emissions of ozone precursors in the Air Basin contribute to air quality problems in neighboring air basins, State law requires the 2010 Clean Air Plan (CAP) include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins. The CAP addresses four categories of pollutants: ozone and ozone precursors (ROG and $NO_x$), particulate matter (primarily $PM_{2.5}$), air toxics, and GHGs. The 2010 CAP contains 55 control strategies.

In response to Senate Bill 656, BAAQMD completed the Particulate Matter Implementation Schedule in November 2005. The implementation schedule evaluates the applicability of 103 PM control measures identified by CARB. BAAQMD implements several regulations and programs to reduce PM emissions, such as controlling dust from earthmoving and construction/demolition operations, limiting emissions from various combustion sources such as cement kilns and furnaces, and reducing PM emissions from composting and chipping activities. In addition to limiting stationary sources, BAAQMD implements a variety of mobile source incentive programs to encourage fleet operators and the public to purchase low-emission vehicles, re-power old polluting heavy-duty diesel engines, and install aftermarket emission control devices to reduce particulates and $NO_x$ emissions.

### BAAQMD Significance Thresholds

BAAQMD has adopted thresholds of significance, included in the most recent BAAQMD's *CEQA Air Quality Guidelines* (BAAQMD Guidelines) (BAAQMD, 2017a). These thresholds were designed to establish the level at which BAAQMD believes air pollution emissions would cause significant environmental impacts under CEQA. The 2017 BAAQMD Guidelines were used in this analysis and are summarized in Table 5.

**Table 5 BAAQMD Air Quality Significance Thresholds**

| Criteria Air Pollutant | Construction Thresholds | Operational Thresholds | |
|---|---|---|---|
| | Average Daily Emissions (lbs/day) | Average Daily Emissions (lbs/day) | Annual Average Emissions (tons/year) |
| ROG | 54 | 54 | 10 |
| $NO_x$ | 54 | 54 | 10 |
| $PM_{10}$ | 82 (Exhaust) | 82 | 15 |
| $PM_{2.5}$ | 54 (Exhaust) | 54 | 10 |
| CO | Not Applicable | 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average) | |
| Fugitive Dust | Construction Dust Ordinance or other Best Management Practices | Not Applicable | |
| **Health Risks and Hazards** | **Single Sources Within 1,000-foot Zone of Influence** | **Combined Sources (Cumulative from all sources within 1000-foot zone of influence)** | |
| Excess Cancer Risk | >10 per one million | >100 per one million | |
| Hazard Index | >1.0 | >10.0 | |
| Incremental annual $PM_{2.5}$ | >0.3 $\mu g/m^3$ | >0.8 $\mu g/m^3$ | |

Regarding the assessment of cumulative impacts, the BAAQMD Guidelines consider a project's contribution to cumulative impacts on regional air quality to be significant if the project's individual impact would be significant (i.e., exceeds the BAAQMD's quantitative thresholds). For a project that would not result in a significant impact individually, the project's contribution to any cumulative impact would be considered less than significant if the project is consistent with the local general plan and the local general plan is consistent with the applicable regional air quality plan. In this case, the applicable regional air quality plan is the 2017 CAP.

## 3.3.3 City of San Pablo General Plan

The City of San Pablo General Plan Open Space and Conservation Element includes the following policies relevant to the reduction in energy use (City of San Pablo, 2011).

- **Policy OSC-I-18:** Work with the BAAQMD to develop and implement a Community Risk Reduction Plan (CRRP) to address the exposure of sensitive populations to toxic air contaminant emissions in San Pablo.

- **Policy OSC-I-19:** Maintain a 500-foot Air Quality Health Risk Overlay Zone on either side of Interstate 80 within the Planning Area to protect sensitive receptors from toxic air emissions. Within this overlay, avoid approval of new sensitive land uses, and for those projects permitted, require site-specific project design improvements (such as higher performance windows and heating, ventilation, and air conditioning systems) in order to reduce public health risks associated with poor air quality in these locations.
- **Policy OSC-I-20:** Require developers to use best management practices (BMPs) to reduce particulate emissions and dust associated with construction activities as a condition for approval of subdivision maps, site plans, and grading permits. These BMPs include, but are not limited to, regular materials and vehicle tire watering, covering, and dust prevention measures during clearing, grading, earth-moving, or excavation operations.
- **Policy OSC-I-22:** Support Contra Costa County Transportation Authority's (CCTA) efforts to address climate change and air quality issues on a regional basis reflected in the '*Principles for Collaborative Development of Sustainable Communities in Contra Costa County'.*
- **Policy OSC-I-23:** Continue to support the BAAQMD's efforts to monitor and control air pollutants from stationary sources.
- **Policy OSC-I-24:** Continue to work with surrounding jurisdictions and agencies to establish parallel air quality programs and implementation measures, as necessary, to improve air quality standards.
- **Policy OSC-I-26:** Promote energy efficiency in architectural design for new construction including building orientation to take advantage of wind and sun, and site design features (such as clustering of uses), pre-wiring for optional photovoltaic or solar heating systems, etc.

## 3.4 EBMUD Practices and Procedures

### 3.4.1 EBMUD Standard Construction Specifications

EBMUD Standard Construction Specifications set forth the contract requirements for environmental compliance to which EBMUD and its contractors must adhere. These specifications are implemented on all EBMUD projects as part of standard construction procedures and stipulate that EBMUD and its contractors are responsible for maintaining compliance with applicable federal, state, and local requirements. The Standard Construction Specification related to air quality that would be implemented as part of the project the Standard Construction Specification 01 35 44, Environmental Requirements (EBMUD, 2018). Specific planning documents and procedures required under this specification are described below.

### Standard Construction Specification 01 35 44, Environmental Requirements

EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements, includes practices and procedures for minimizing air quality impacts such as dust control, emissions control, and use of BAAQMD-compliant architectural coatings, as described below.

**Dust Control Measures**

In accordance with Section 3.3.B, Dust Control, of Standard Construction Specification 01 35 44, Environmental Requirements, the project contractor must implement all necessary dust control measures, including but not limited to the following:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) must be watered minimum two times per day or as directed by the engineer.
- Water and/or coarse rock all dust-generating construction areas as directed by the engineer to reduce the potential for airborne dust from leaving the site.
- Water and/or cover soil stockpiles daily.
- Cover all haul trucks entering/leaving the site and trim their loads, as necessary.
- Using wet power vacuum street sweepers (dry power sweeping is prohibited) to:
  - Sweep all paved access road, parking areas, and staging areas at the construction site daily or as often as necessary.
  - Sweep public roads adjacent to the site at least twice daily or as often as necessary.
- All trucks and equipment, including their tires, must be washed off prior to leaving the site.
- Gravel or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Site accesses to a distance of 100 feet from the paved road must be treated with 12 inches of compacted coarse rock.
- Sandbags or other erosion control measures must be installed to prevent silt run-off to public roadways from sites with a slope greater than 1 percent.
- All roadways, driveways, and sidewalks to be paved must be completed as soon as possible.
- Building pads must be laid as soon as possible after grading unless seeding or soil binders are used.
- Vegetative ground cover (e.g., fast-germinating native grass seed) must be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- Wind breaks (e.g., fences) must be installed on the windward sides(s) of actively disturbed areas of construction. Wind breaks should have a maximum 50 percent air porosity.
- The simultaneous occurrence of excavation, grading, and ground disturbing construction activities on the same area at any one time must be limited.

Activities must be phased to reduce the amount of disturbed surfaces at any one time.
- All excavation, grading, and/or demolition activities must be suspended when average wind speeds exceed 20 miles per hour (mph).
- All vehicle speeds must be limited to 15 mph or less on the construction site and any adjacent unpaved roads.

**Air Quality and Emissions Control**
In accordance with Section 3.4.A, Air Quality and Emissions Control, of EBMUD Standard Construction Specification 01 35 44, Environmental Requirements, the project contractor must implement the following control measures:

- Ensure that line power is used instead of diesel generators at all construction sites where line power is available.
- Ensure that for operation of any stationary, compression-ignition engines as part of construction, comply with Section 93115, Title 17, California Code of Regulations, Airborne Toxic Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements as well as emission standards.
- Fixed temporary sources of air emissions (such as portable pumps, compressors, generators, etc.) must be electrically powered unless the contractor submits documentation and receives approval from the engineer that the use of such equipment is not practical, feasible, or available. All portable engines and equipment units used as part of construction must be properly registered with the CARB or otherwise permitted by the BAAQMD, as required.
- Implementation of standard air emissions controls such as:
  - Minimize the use of diesel generators where possible.
  - Idling times must 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 (ATCM) Title 13, Section 2485 of California Code of Regulations. Clear signage must be provided for construction workers at all access points.
  - Minimize the idling time of diesel-powered construction equipment to 5 minutes.
  - Follow applicable regulations for fuel, fuel additives, and emission standards for stationary, diesel-fueled engines.
  - Locate generators at least 100 feet away from adjacent homes and ball fields.
  - Perform regular low-emission tune-ups on all construction equipment, particularly haul trucks and earthwork equipment.
- Implementation of the following measures to reduce GHG emissions from fuel combustion:

- On road and off-road vehicle tire pressures must be maintained to manufacturer specifications. Tires must be checked and re-inflated at regular intervals.
- Construction equipment engines must be maintained to manufacturer's specifications. All equipment must be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- All construction equipment, diesel trucks, and generators must be equipped with Best Available Control Technology (BACT) for emission reductions of NOx and PM.

**Architectural Coatings**

In accordance with Section 3.4.B, Architectural Coatings, of Standard Construction Specification 01 35 44, Environmental Requirements, the project contractor must use architectural coatings in compliance with appropriate Volatile Organic Compound limits as established in the BAAQMD's Regulation 8, Rule 3, and any amendments thereto.

# 4 Impact Analysis

## 4.1 Methodology for Analysis

### 4.1.1 Construction Emissions

The analysis of potential air quality impacts uses the project-level analysis methodology identified by the 2017 BAAQMD Guidelines. Based on the 2017 BAAQMD Guidelines, construction emissions from the project are quantified and compared to significance thresholds recommended by the BAAQMD and adopted by the City of San Pablo. The CalEEMod version 2016.3.2, the EMFAC2017 version 9.0, and the Sacramento Air Quality Management District RCEM Version 9.0 were used to estimate emissions from the project. CalEEMod estimates emissions from area sources based on land uses, while EMFAC has been developed to estimate emissions from worker, hauling, and vendor trips. RCEM has been developed to estimate emissions specifically from linear construction projects (e.g., roadways, bridges, and pipelines). Emissions from the construction area were estimated using CalEEMod and RCEM, while construction emissions related to the vehicular movement of the project materials were estimated using EMFAC.

The latest version of the CalEEMod model is based on the older version of the CARB EMFAC 2014 motor vehicle emission factor model. Because CalEEMod has not been updated to include EMFAC2017, construction trip information estimated by EBMUD for the construction of the project was applied to EMFAC2017 motor vehicle emissions factors to estimate construction site trip emissions, which include worker travel, vendor trucks and haul trucks.[1] The number of workdays, equipment for each project phase, and trip estimates provided by EBMUD were also input into CalEEMod and RCEM to generate construction emissions estimates.

**CalEEMod Land Use Inputs.** Land uses were input into CalEEMod as follows:

- 3,360 square feet (sf) entered as "Industrial – General Light Industry" on 0.38 acres for the construction of the new pumping plant.

**RCEM Project Type Inputs.** The project inputs for the RCEM model include:

- Other Linear Project Type 4; Non-roadway (i.e., pipeline)
- Predominate Soil/Site Type 1; Sand Gravel

[1] See CARB's EMFAC2017 Web Database at https://www.arb.ca.gov/emfac/2017/

For the purposes of this analysis, the following information, which was provided by EBMUD, regarding construction methods, schedule, and trip generation was used:

- **Construction Inputs.** The construction build-out scenario, including equipment list and schedule, were based on information provided by EBMUD for each of the construction phases. CalEEMod and RCEM compute annual emissions for construction that are based on the project type, size, and acreage. CalEEMod provided emission estimates for the pumping plant construction activities, including installation of the suction and discharge pipelines, while RCEM was used to estimate emissions related to the storm drain pipeline construction only. Both models estimate emissions for on-site and off-site construction activities. On-site activities are primarily comprised of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic.
- **Construction Durations.** This air quality analysis is based on a conservative set of data and assumptions regarding the start of construction and project duration. A compressed schedule of 13 months, incorporating overlapping schedules for the installation of the storm drain pipeline, over which the construction emissions would be produced was used for the analysis. A stated duration of 16 months (69 weeks) was provided for this analysis, but the 13-month[2] approach would produce a higher, more conservative emission rate. The current project durations include a total of 45 weeks (10.5 months) for the mobilization, site preparation and tree removal, initial excavation and grading, and pumping plant construction phases; a 4-week (1-month) trenching phase, including trenching for onsite suction and discharge pipelines and the offsite storm drain pipeline on Road 20; a 2-week paving phase; a 2-week architectural coating phase, and a 2-week grading phase. The 13-month duration used in this analysis presents more conservative emissions results because the same amount of emissions would occur over a shorter period. Emissions would be at a maximum at any one time.
- **Construction Traffic Emissions.** Construction would produce traffic in the form of worker trips, vendor trips, and material hauling trips. Traffic-related emissions from the pumping plant construction are based on estimates of worker, vendor, and material hauling trips provided by EBMUD and on EMFAC2017 emissions factors for 2026. For traffic-related emissions from the Road 20 storm drain pipeline construction, RCEM was utilized. Trips entered into RCEM for storm drain pipeline construction were not included in the EMFAC2017 calculations to avoid double counting the storm drain pipeline installation trips. EMFAC2017 provides aggregate emission rates in grams per

[2] The 13-month compressed timeline includes removal of the 10-week equipment testing phase from the emissions analysis and overlap of the storm drain installation phase with the pumping plant suction and discharge pipeline phase.

mile for each vehicle type. The construction traffic vehicle mix for this analysis was based on CalEEMod default assumptions, where worker trips were assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1 and LDT2). Vendor trips were comprised of delivery and large trucks (EMFAC category MHDT and HHDT) and haul trips, including cement trucks, were comprised of large trucks (EMFAC category HHDT). Travel distances were based on CalEEMod default lengths, which are approximately 10.8 miles for worker travel, approximately 7.3 miles for vendor trips, and approximately 20 miles for hauling. Because CalEEMod does not address cement or asphalt haul trips, these were treated as vendor travel distances (approximately 7.3 miles). Each trip was assumed to include an idle time of 5 minutes and emissions associated with vehicle starts were also included. EMFAC2017 emission rates from calendar years 2026 and 2027 for Contra Costa County were used. Emissions rates for years beyond 2027 are less than those anticipated in 2027 because of anticipated future reduction in emissions from use of improved and more efficient future equipment and technology. Therefore, 2026 and 2027 emissions represent a conservative estimate should construction traffic emissions occur in 2028 or beyond. **Error! Reference source not found.** provides the traffic inputs that were combined with the EMFAC2017 emission factors to compute vehicle emissions for construction of the project.

**Table 6 Construction Traffic Data Used for EMFAC2017 Model Runs**

| CalEEMod Run/Land Uses and Construction Phase | EMFAC2017 Trips by Trip Type | | | Notes |
|---|---|---|---|---|
| | Total Worker | Total Vendor | Total Haul | |
| Vehicle mix[1] | 71.0% LDA<br>6.9% LDT1<br>22.1% LDT2 | 31.7% MHDT<br>68.3% HHDT | 100% HHDT | N/A |
| Trip Length (miles)[2] | 10.8 | 7.3 | 20 soil<br>7.3 asphalt<br>7.3 concrete | 5-minute truck idle time |
| Construction | 15,028 | 233 | 3,182 | 1,147 cubic yards (cy) soil import[3]<br>2,237 cy soil export<br>113 cement truck trips |

[1] Based on 2026 and 2027 EMFAC2017 vehicle fleet mix for Contra Costa County.
[2] Based on CalEEMod default lengths.
[3] Asphalt concrete volume not included because it does not generate fugitive dust.
Table Notes:
LDA: Light-duty autos
LDT1 and LDT2: Light-duty trucks
MHDT: Delivery trucks
HHDT: Large trucks

Phases, trips, and equipment were provided by EBMUD. For entry into CalEEMod default construction phases, the provided phases were grouped and modeled as shown in Table 7.

RCEM estimates trip emissions using information input on soil and asphalt import/export volumes, miles per trip, number of employees, and the estimated trips per day. Worker commute trips are assumed to be comprised of light-duty trucks (EMFAC category LDT1 and LDT2) and all other trips are assumed to be made by heavy-heavy duty diesel trucks (EMFAC category HHDT). Table 8 provides the traffic inputs used to compute emissions estimates for construction of the new storm drain pipeline using RCEM.

**Table 7 CalEEMod Construction Phase Grouping**

| CalEEMod Phase | EBMUD Phase |
|---|---|
| Demolition | Mobilization |
| Site Preparation | Site Preparation and Tree Removal |
| Grading | Initial Excavation and Grading |
| Trenching | Off-Site Storm Drain Pipeline Installation on Road 20 |
| | Pumping Plant Suction and Discharge Pipelines |
| Building Construction | Pumping Plant Construction (Concrete Work) |
| | Pumping Plant Onsite Drainage |
| | Civil Site Work: CMU Wall, Fence, Driveway, and Landscaping |
| Paving | Final Grading, Backfill, and Paving |
| | Demobilization |
| Architectural Coating | Pumping Plant Construction (Other) |

**Table 8 Construction Traffic Data Used for RCEM Model Runs**

| Material Type | Material Hauling Quantity Input | | | Notes[1] |
|---|---|---|---|---|
| | Import (cy/day) | Export (cy/day) | Haul Capacity (cy) | |
| Soil | 17.86 | 24.83 | 20 | Used RCEM Default Haul Capacity |
| Asphalt | 4.44 | 0 | 20 | Used RCEM Default Haul Capacity |
| **Trip Type** | **Round Trips Per Day** | | **Miles Per Round Trip** | **Notes** |
| Soil | 2 | | 20 | Based on information provided by EBMUD |
| Asphalt | Default[2] | | 7.3 | Based on material volume provided by EBMUD |
| Worker | 15 | | 20 | Based on a maximum of 15 workers provided by EBMUD |

[1] Based on the higher of following: RCEM default haul capacity and haul capacity provided by EBMUD.
[2] Default value is 1 round trip per day.

### 4.1.2 Operational Emissions

Once operational, the project would not include any new sources of emissions. The new pumping plant would operate in a similar manner as the existing RCS, which is currently operated and monitored remotely. Worker vehicle trips for operation and maintenance would be similar to existing conditions, with approximately four one-way trips (two roundtrips) per month. Therefore, operational emissions were not quantified for the project.

### 4.1.3 Health Risk Assessment

As indicated by BAAQMD Guidelines, emissions pose potential health risk and hazard impacts when sensitive receptors are located within 1,000 feet of emission sources. An HRA was conducted to assess potential TAC impacts from DPM and local $PM_{2.5}$ concentrations from project construction using methodologies published by the OEHHA. OEHHA is responsible for developing and revising guidelines for performing HRAs under the State's Air Toxics Hot Spots Program Risk Assessment (AB 2588) regulation. In March 2015, OEHHA adopted revised guidelines, the *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, which updated the previous guidance by incorporating advances in risk assessment with consideration of infants and children using "Age Sensitivity Factors" (OEHHA, 2015). These changes also consider the sensitivity of children to TAC emissions, different breathing rates, and time spent at home.

The HRA is a quantitative analysis of project construction emissions, given the proximity of construction activity on the project site to sensitive receptors. The analysis evaluates whether the project would cause health risks at nearby receptors that exceed the BAAQMD thresholds. Acute risks were not evaluated as DPM exposure does not represent an acute health risk. The project would not include any permanent or significant operational sources of TAC emissions nor would it include any land uses considered sensitive to TACs emitted by surrounding land uses. Therefore, no further discussion of operational TAC impacts is included.

# 5 Project Impacts and Mitigation Measures

## 5.1 Significance Criteria

Consistent with Appendix G of the CEQA Guidelines, the project is considered to have a significant impact related to air quality if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. 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.
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

## 5.2 Impacts and Mitigation Measures

**Impact Air Quality-1: Potential to conflict with or obstruct implementation of the applicable air quality plan.** ***(Less than Significant)***

The BAAQMD Guidelines recommend that a project's consistency with the current air quality plan be evaluated using the following three criteria:

a. The project supports the goals of the applicable air quality plan.
b. The project includes applicable control measures from the air quality plan.
c. The project does not disrupt or hinder implementation of any control measures from the air quality plan.

If it can be concluded with substantial evidence that a project would be consistent with the above three criteria, then the BAAQMD considers the project to be consistent with air quality plans prepared for the Bay Area (BAAQMD, 2017a).

The most recently adopted air quality plan applicable to the project is the BAAQMD's 2017 CAP. The primary goals of the 2017 CAP are to attain air quality standards, reduce population exposure, protect public health in the Bay Area, reduce GHG emissions, and protect the climate. The 2017 CAP includes a range of control measures that consist of actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs. Numerous measures address the reduction of several pollutants: $O_3$ precursors, PM, air toxics, and/or GHGs. Other measures focus on a single type of pollutant, super GHGs such as methane and black carbon, or harmful fine particles that affect public health.

The BAAQMD-recommended guidance for determining if a project supports the goals in the current clean air plan is to compare project-estimated emissions with BAAQMD thresholds of significance. If project emissions would not exceed the thresholds of significance after the application of all feasible mitigation measures, the project would be consistent with the goals of the 2017 CAP. Table 9 summarizes the construction emissions from the project. The emissions would not exceed any of the BAAQMD significance thresholds.

As indicated in Impact Air Quality-2 and Impact Air Quality-3 below, and the *Wildcat Pumping Plant Project Greenhouse Gas Technical Report* (Panorama Environmental and Illingworth & Rodkin, Inc., 2021), the project's TAC and GHG emissions would also not exceed threshold levels (consistent with the BAAQMD Guidelines), indicating that project-related emissions would not have a significant impact on regional air quality or climate change, and would not pose significant health risks to the public (Panorama Environmental and Illingworth & Rodkin, Inc., 2021).

Regardless of whether a project's emissions exceed the BAAQMD significance thresholds, the BAAQMD recommends that all projects implement the Basic Construction Mitigation Measures that primarily address dust control. The BAAQMD considers implementation of the BAAQMD-recommended mitigation measures for fugitive dust sufficient to ensure that construction-related fugitive dust is reduced to a less-than-significant level. As detailed in Section 3.4.1, a number of EBMUD standard practices and procedures, applicable to all EBMUD projects, have been incorporated into the project, including Standard Construction Specification 01 35 44, Environmental Requirements. Section 3.3.B, Dust Control include measures that are consistent with BAAQMD's mitigation measures recommended for all projects, including the following:

- Watering of exposed surfaces two times per day (or as directed by the engineer)
- Covering all haul trucks entering/leaving the site
- Using wet power vacuum street sweepers on paved work areas and adjacent public roads
- Paving of roadways, driveways, and sidewalks as soon as possible
- Limiting all vehicle speeds to 15 mph or less.

Furthermore, EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements, Section 3.3.B, Dust Control, includes measures consistent with BAAQMD's Construction Mitigation Measures Recommended for Projects with Construction Emissions above Thresholds, including the following:

- Suspending excavation, grading, and/or demolition when average wind speeds exceed 20 mph
- Installing wind breaks on the windward side(s) of actively disturbed areas of construction
- Limiting simultaneous excavation, grading, and ground-disturbing activities on the same area at any one time

- Planting of vegetative ground cover as soon as possible and watering until vegetation is appropriately established
- Washing of all trucks and equipment (including tires) prior to leaving the construction site
- Treating site accesses with 12 inches of compacted coarse rock to a distance of 100 feet from paved roads
- Installing sandbags or other erosion control measures to prevent silt run-off from sites with a slope greater than 1 percent

In addition, EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements, Section 3.4.B, Architectural Coatings, requires EBMUD to use architectural coatings compliant with appropriate VOC limits as established in the BAAQMD regulations to reduce volatile organic compound (i.e., ROG) emissions during construction and maintenance.

Because the estimated construction emissions from the project would be less than the recommended BAAQMD significance thresholds for construction and operation and EBMUD and its contractor would implement Standard Construction Specification 01 35 44, Environmental Requirements, as part of the project, which includes Section 3.3.B, Dust Control, and Section 3.4.B, Architectural Coatings, and require implementation of various construction-related dust control measures and compliance with VOC limits for architectural coatings, respectively, the project would be consistent with the three BAAQMD criteria described above and would not conflict with or obstruct implementation of the 2017 CAP, resulting in a less-than-significant impact.

**Impact Air Quality-2: Potential 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. (*Less than Significant*)**

### Construction

Emissions from removal of the existing trees, foundation excavation, and construction of the pumping plant were estimated using CalEEMod, while construction emissions related to the installation of the storm drain pipeline was estimated using RCEM. Average daily emissions were computed by summing the emissions from each phase and dividing the total construction emissions by the number of total workdays for the 13-month schedule conservatively used for this analysis. Table 9 provides the average daily construction emissions (unmitigated) of ROG, $NO_X$, $PM_{10}$ exhaust, and $PM_{2.5}$ exhaust estimated during construction of the project. Model output from CalEEMod and RCEM are included as Appendix B and EMFAC2017 vehicle emissions modeling outputs are included in Appendix C.

As indicated in Table 9, predicted construction-period emissions would not exceed the BAAQMD significance thresholds.

**Table 9 Construction Period Emissions**

| Scenario | ROG (tons) | NOx (tons) | $PM_{10}$ Exhaust (tons) | $PM_{2.5}$ Exhaust (tons) |
|---|---|---|---|---|
| Pumping Plant Construction | 0.055 | 0.370 | 0.014 | 0.013 |
| Pumping Plant Construction Trips | 0.014 | 0.139 | 0.013 | 0.006 |
| Road 20 Storm Drain Pipeline Construction with Trips | 0.004 | 0.014 | 0.002 | 0.001 |
| Total construction emissions (tons) | 0.07 | 0.52 | 0.03 | 0.02 |
| Average daily emissions (pounds/day)[2] | 0.88 lbs/day | 3.62 lbs/day | 0.18 lbs/day | 0.13 lbs/day |
| ***BAAQMD Thresholds (pounds per day)*** | *54 lbs/day* | *54 lbs/day* | *82 lbs/day* | *54 lbs/day* |
| **Exceed Threshold?** | No | No | No | No |

[2]Analysis uses a more conservative condensed project duration of 13 months. Pounds per day would be less if dispersed over a longer construction duration.

As detailed in Section 3.4.1, a number of EBMUD standard practices and procedures, applicable to all EBMUD projects, that would be implemented as part of the project would further reduce construction-related emissions. EBMUD Standard Construction Specification 01 35 44, Environmental Requirements, Section 3.4.A, Air Quality and Emissions Control, requires the project contractor to implement the following requirements:

- Use of line power instead of diesel generators at all construction sites where line power is available.
- Compression-ignition engines must comply with Section 93115, Title 17, California Code of Regulations, Airborne Toxic Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements as well as emission standards.
- Portable pumps, compressors, generators, etc. must be electrically powered unless such equipment is not practical, feasible, or available.
- All portable engines and equipment units used as part of construction must be properly registered with CARB or otherwise permitted by BAAQMD.
- Idling times must 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 ATCM Title 13, Section 2485 of California Code of Regulations.
- All construction equipment, diesel trucks, and generators must be equipped with BACT for emission reductions of NOx and PM. Low-emission tune-ups must be performed on all construction equipment, particularly haul trucks and earthwork equipment.

Additionally, Section 3.4.B, Architectural Coatings, of EBMUD Standard Construction Specification 01 35 44, Environmental Requirements, requires the project contractor to comply with appropriate limits as established by BAAQMD's Regulation 8, Rule 3.

Because compliance with existing regulations and programs are mandatory and EBMUD and its contractor would implement EBMUD Standard Construction Specifications 01 35 44, Environmental Requirements, as part of the project, which includes Section 3.4.A, Air Quality and Emissions Control and Section 3.4.B, Architectural Coatings, and require implementation of various emission controls and reduction measures and compliance with VOC limits for architectural coatings, respectively, the project would not result in a cumulatively considerable net increase of any criteria pollutant and impacts from construction would be less than significant.

### Operation

As discussed in Section 0, the pumping plant would be operated in a similar manner as the existing RCS. Because the project would not result in a substantial change to operational emissions, the impact would be less than significant.

**Impact Air Quality-3: Potential to expose sensitive receptors to substantial pollutant concentrations. (*Less than Significant*)**

### Construction

#### Overview

Although it was concluded under Impact Air Quality-1 and Impact Air Quality-2 that construction exhaust air pollutant emissions would not contribute substantially to existing or projected air quality violations, construction exhaust emissions may still pose health risks for sensitive receptors, such as surrounding residents. The primary community risk impact issue associated with construction emissions are cancer risk associated with DPM, which is identified by CARB as a TAC due to the potential to cause cancer, and non-cancer health impacts associated with exposure to fugitive sources of $PM_{2.5}$. Construction equipment and associated heavy-duty truck traffic generates DPM, while construction activities generate fugitive $PM_{2.5}$. A health risk assessment was conducted per the OEHHA and CARB recommended methods for conducting health risk assessments. BAAQMD thresholds for cancer risk, $PM_{2.5}$ concentration, and HI were applied to the health risk assessment to evaluate potential cancer risk and potential non-cancer health effects to nearby sensitive receptors from project-related construction emissions of DPM and $PM_{2.5}$.

#### Construction Period Emissions

Both the CalEEMod model and the RCEM model provided annual $PM_{10}$ exhaust emissions (assumed to be DPM) for the off-road construction equipment and EMFAC2017 was used to estimate exhaust emissions from on-road vehicles. Annual DPM emissions from construction activities at the pumping plant site was estimated to be 0.027 tons (54 pounds), and the DPM emissions from the installation of the new storm drain pipeline was estimated to be less than 0.002 tons (4 pounds). It was assumed emissions from on-road vehicles traveling at or near the site would occur at the project site. The on-road emissions at the project site are a result of haul truck travel during grading and excavation activities, worker travel, and vendor deliveries during construction. An on-site trip length of one mile was used to represent vehicle travel within the project work areas along the Road 20 storm drain pipeline installation alignment.

This distance conservatively assumes each vehicle would traverse the storm drain pipeline alignment, end to end, six times per day. Within the Wildcat PP site, an on-site trip length of 0.5 mile was conservatively used to represent vehicle travel within the pumping plant site. Fugitive $PM_{2.5}$ dust emissions from the construction of the pumping plant were estimated to be 0.0018 tons (3.6 pounds) using the same methods and assumptions used to estimate site DPM emissions.

**Dispersion Modeling**

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (i.e., residents, school children, elderly) in the vicinity of the project construction areas. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling ambient impacts of these types of emission activities for CEQA projects (BAAQMD, 2012). The modeling utilized area sources to represent the on-site construction emissions of the pumping plant. Line-volume sources were created to represent traffic emissions on El Portal Drive. An area source was created for each pollutant modeled at the site (i.e., one for exhaust emissions and one for fugitive dust emissions, or two area sources). To represent the construction equipment exhaust emissions, an emission release height of approximately 19.7 feet (6 meters) was used, based technical guidance provided by CARB (CARB, 2007). The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of approximately 6.6 feet (2 meters) was used as the average release height across the construction site. Emissions from the construction equipment and on-site vehicle travel were distributed throughout the modeled area sources. Construction emissions were conservatively modeled as occurring daily between 7:00 a.m. to 7:00 p.m. when most of the site activity would occur in order to analyze the highest concentration and potential impacts.

The modeling used a five-year data set (2013 to 2017) of hourly meteorological data from Oakland Airport[3] that was prepared for use with the AERMOD model by BAAQMD. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the construction and demolition periods were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors. Receptor heights of approximately 5 feet (1.5 meters), 14.7 feet (4.5 meters), and 24.9 feet (7.6 meter) were used to represent the breathing heights on the ground, second, and third floors at the nearby single-family and multi-family residences, as appropriate.

[3] This meteorological data is the closest available BAAQMD dataset to the project site. The Oakland Airport climate is also the best analog for the climate in the City of San Pablo.

**Project Construction Community Risk Impacts**
*Overview*

## The maximum modeled annual DPM and $PM_{2.5}$ concentrations, which includes both the DPM and fugitive $PM_{2.5}$ concentrations, were identified at nearby sensitive receptors for the pumping plant and storm drain pipeline construction (as shown in Figure 4) to find the MEIs. Using the maximum annual modeled DPM concentrations, the maximum increased cancer risks were calculated using BAAQMD-recommended methods and exposure parameters described in

Appendix A. HI and maximum annual $PM_{2.5}$ concentrations were also calculated and identified. Appendix D includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

***Pumping Plant and Road 20 Storm Drain Pipeline***
Results of the health risk assessment for construction activities indicated that the MEI for the pumping plant and storm drain pipeline are located on the second floor of a multi-family residence adjacent to the southern boundary of the pumping plant site (shown in Figure 4). **Error! Not a valid bookmark self-reference.** summarizes the cancer risks, $PM_{2.5}$ concentrations, and HI for project-related construction activities affecting the off-site residential MEIs.

**Table 10 Construction Risk Impacts at the Residential MEI**

| Source | Cancer Risk (per million) | Annual $PM_{2.5}$ ($\mu g/m^3$) | Hazard Index |
|---|---|---|---|
| Pumping Plant and Road 20 Storm Drain Pipeline Construction (without Standard Construction Specification 01 35 44 measures applied) | 24.91 (infant) | 0.09 | 0.01 |
| Pumping Plant and Road 20 Storm Drain Pipeline Construction (with Standard Construction Specification 01 35 44 measures applied) | 9.51 (infant) | 0.06 | 0.01 |
| ***BAAQMD Single-Source Threshold*** | ***>10.0*** | ***>0.3*** | ***>1.0*** |
| *Exceed Threshold?** | *No* | *No* | *No* |

* Threshold exceedance accounts for the emission reductions that would accompany EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements, Section 3.4.A, Air Quality and Emissions Control.

The increased cancer risks and maximum $PM_{2.5}$ concentration from construction would exceed the BAAQMD single-source thresholds of greater than 10.0 per million for cancer risk and greater than 0.3 $\mu g/m^3$ for annual $PM_{2.5}$ concentration without any controls or specifications in place. As detailed in Section 3.4.1, several EBMUD standard practices and procedures, applicable to all EBMUD projects, including Standard Construction Specification 01 35 44, Environmental Requirements, would be implemented as part of the project. Section 3.4.A, Air Quality and Emissions Control, of Standard Construction Specification 01 35 44, Environmental Requirements, requires the implementation of various air quality and emissions controls, including, requiring that all construction equipment, diesel trucks, and generators be equipped with BACT for emission reductions of NOx and PM. Implementation of Specification 01 35 44, Environmental Requirements, Section 3.4.A, Air Quality and Emissions Control, in this analysis

**Figure 4 Locations of Off-Site Sensitive Receptors and MEI**

**assumes the use of engines that meet the Tier 4 Final Standards, EPA's most stringent standards for off-highway diesel engines, as the BACT for all construction equipment. As indicated in Using the maximum annual modeled DPM concentrations, the maximum increased cancer risks were calculated using BAAQMD-recommended methods and exposure parameters described in**

Appendix A. HI and maximum annual $PM_{2.5}$ concentrations were also calculated and identified. Appendix D includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

***Pumping Plant and Road 20 Storm Drain Pipeline***

Results of the health risk assessment for construction activities indicated that the MEI for the pumping plant and storm drain pipeline are located on the second floor of a multi-family residence adjacent to the southern boundary of the pumping plant site (shown in Figure 4). **Error! Not a valid bookmark self-reference.** summarizes the cancer risks, $PM_{2.5}$ concentrations, and HI for project-related construction activities affecting the off-site residential MEIs.

Table 10, the project would not exceed the BAAQMD single-source thresholds of greater than 10.0 per million for cancer risk and greater than 0.3 $\mu g/m^3$ for annual $PM_{2.5}$ concentration. The non-cancer hazards from construction activities would be below the single-source significance threshold of 1.0. Because Standard Construction Specification 01 35 44, Environmental Requirements, has been incorporated into the project and includes implementation of emission controls such as use of BACT-equipped equipment and trucks, the impacts to sensitive receptors related to construction emissions of the new pumping plant would be less than significant.

### Operation

Operation of the new pumping plant would not be a source of significant TAC pollutant emissions. No permanent fuel combustion equipment (i.e., diesel generators or pumps) are planned at the site under normal operations. Portable emergency generators may be used at the site, but would not be permanent or required for normal operation of the facility. Therefore, emissions associated with the operation of the pumping plant would primarily include those from vehicles that occasionally travel to and from the site. The estimated trips to and from the site (i.e., two trips per month) would be less than those generated by a single residence. Operation of the project would not expose sensitive receptors to substantial pollutant concentrations, and the impact would be less than significant.

**Impact Air Quality-4: Potential to result in other emissions (such as those leading to odors) adversely affecting a substantial number of people *(Less than Significant)***

### Construction

Short-term construction activities using equipment and vehicles that emit diesel- and/or gasoline-engine exhaust odors could be a potential source of objectionable odors and noticeable in the immediate vicinity of the operating equipment. Construction odors would be temporary and the location of the construction equipment would vary spatially at different points within the PP site and Road 20 storm drain pipeline alignment; therefore, any odors generated during construction would not affect a substantial number of people. Furthermore, as detailed in Section 3.4, a number of EBMUD standard practices and procedures, applicable to all EBMUD projects, have been incorporated into the project, including Standard Construction Specification 01 35 44, Environmental Requirements. Section 1.3.I, Tune-up Logs, of this specification requires tune-up logs that provide records that show construction equipment in use at the project sites has undergone required maintenance and requires the submittal of a log of required tune-ups for all construction equipment, particularly haul and delivery trucks, on a quarterly basis for review. Implementation of Section 1.3.I, Tune-up Logs, would ensure that construction equipment used at the project site would be maintained regularly for efficient operation, reducing exhaust emissions to the environment that could generate objectionable odors.

In addition, Section 3.4.A, Air Quality and Emissions Control, of EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements, includes the following provisions for air quality and emissions control:

- Use of line power instead of diesel generators at all construction sites where line power is available.
- Compliance with Section 93115, Title 17, California Code of Regulations, ATCM for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements as well as emission standards, for operation of any stationary, compression ignition engines as part of construction.
- Use of electrically powered fixed temporary sources of air emissions (such as portable pumps, compressors, generators, etc.) unless the contractor submits documentation and receives approval from the engineer that the use of such equipment is not practical, feasible, or available. All portable engines and equipment units used as part of construction shall be properly registered with CARB or otherwise permitted by the appropriate local air district, as required.
- Implement standard air emission controls such as:
  - Minimize the use of diesel generators where possible.
  - Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to five minutes as required by the California ATCM, Title 13, Section 2485 of California Code of Regulations. Clear signage shall be provided for construction workers at all access points.
  - Follow applicable regulations for fuel, fuel additives, and emission standards for stationary, diesel-fueled engines.
  - Locate generators at least 100 feet away from adjacent homes.
  - Perform regular low-emission tune-ups on all construction equipment, particularly haul trucks and earthwork equipment.

Implementation of Section 3.4.A, Air Quality and Emissions Control, would ensure specified air emissions control BMPs would be implemented to minimize short-term construction diesel exhaust emissions that could generate objectionable odors.

Because Section 1.3.I, Tune-up Logs, and Section 3.4.A, Air Quality and Emissions Control, of EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements, have been incorporated into the Project, and require regular maintenance of construction vehicles and equipment, and include provisions for BMPs for air emissions control, the project impact related to creation of objectionable odors affecting a substantial number of people during construction would be less than significant.

### Operation

Operation of the Wildcat PP uses pumps powered by electricity and would not generate any odors. Therefore, operation of the new pumping plant would not generate emissions that are likely to adversely affect the public off site or result in confirmed odor complaints. Because the new pumping plant will not include any new sources of significant odors, the impact would be less than significant.

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# Appendix A Health Risk Calculation Methodology

# Appendix B CalEEMod and RCEM Model Outputs

# Appendix C EMFAC2017 Vehicle Emissions Modeling Outputs

# Appendix D Emission Factor Inputs