

3.3 AIR QUALITY

This section includes a discussion of existing air quality conditions, a summary of applicable regulations, and an analysis of potential short-term and long-term air quality impacts caused by the proposed project. The method of analysis for short-term construction, long-term regional (operational), local mobile-source, and toxic air emissions is consistent with the recommendations of the Bay Area Air Quality Management District (BAAQMD), the California Air Resources Board (ARB), and the U.S. Environmental Protection Agency (U.S. EPA). In addition, mitigation measures are recommended as necessary to reduce significant air quality impacts.

3.3.1 REGULATORY SETTING

The project site is located in the San Francisco Bay Area Air Basin (SFBAAB). Air quality at the project site is regulated by the U.S. EPA, ARB, and the BAAQMD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although U.S. EPA regulations may not be superseded, both state and local regulations may be more stringent.

Concentrations of several air pollutants—ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), inhalable particulate (PM₁₀), fine particulate matter (PM_{2.5}), and lead—indicate the quality of ambient air and are, therefore, the premise of air quality regulations. Because these pollutants are the most prevalent air pollutants known to be harmful to human health, they are commonly referred to as “criteria air pollutants.” Their effects on human health have been studied in depth and their criteria for affecting health have been documented. Acceptable levels of exposure to criteria air pollutants have been determined and ambient standards have been established for them (Table 3.3-1).

Air quality regulations also focus on toxic air contaminants (TACs), or in federal parlance, hazardous air pollutants (HAPs). In general, for those TACs that may cause cancer, all concentrations present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. U.S. EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These statutes and regulations, in conjunction with additional rules set forth by BAAQMD, establish the regulatory framework for TACs.

Applicable regulations associated with criteria air pollutants, TACs, and odors are described below.

FEDERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

The U.S. EPA has been charged with implementing national air quality programs. The U.S. EPA’s air quality mandates are drawn primarily from the Federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments were made by Congress were in 1990.

Table 3.3-1 Summary of Ambient Air Quality Standards

Pollutant	Averaging Time	California	National Standards ¹	
		Standards ^{2,3}	Primary ^{3,4}	Secondary ^{3,5}
Ozone	1-hour	0.09 ppm (180 µg/m ³)	–	–
	8-hour	0.070 ppm (137 µg/m ³)	0.075 ppm (147 µg/m ³)	Same as Primary Standard
Carbon monoxide (CO)	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	–
	8-hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	–
Nitrogen dioxide (NO ₂)	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	53 ppb (100 µg/m ³)	Same as Primary Standard
	1-hour	0.18 ppm (339 µg/m ³)	100 ppb	–
Respirable particulate matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	–	Same as Primary Standard
	24-hour	50 µg/m ³	150 µg/m ³	
Fine particulate matter (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	15.0 µg/m ³	Same as Primary Standard
	24-hour	No Separate State Standard	35 µg/m ³	
Sulfur dioxide (SO ₂) ⁶	24-hour	0.04 ppm (105 µg/m ³)	–	–
	3-hour	–	–	0.5 ppm (1,300 µg/m ³)
	1-hour	0.025 ppm (655 µg/m ³)	75 ppb (196 µg/m ³)	–
Lead ⁷	30-day Average	1.5 µg/m ³	–	–
	Calendar Quarter	–	1.5 µg/m ³	Same as Primary Standard
	Rolling 3-Month Average	–	0.15 µg/m ³	
Sulfates	24-hour	25 µg/m ³	No National Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)		
Vinyl Chloride ⁷	24-hour	0.01 ppm (26 µg/m ³)		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer — visibility of 10 mi or more		

Notes: ppb = parts per billion; ppm = parts per million; µg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter

¹ National standards (other than ozone, particulate matter, and those standards based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. The PM₁₀ 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than 1 day. For PM_{2.5}, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency for further clarification and current federal policies.

² California standards for ozone, CO (except Lake Tahoe), NO₂, and particulate matter are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

³ Concentrations are expressed first in units in which they were issued (i.e., ppb, ppm or µg/m³). Equivalent units given in parentheses are based on a reference temperature of 25 °C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25 °C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

⁴ National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

⁵ National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

⁶ The U.S. EPA strengthened the NAAQS for SO₂ on June 2, 2010 by establishing a new 1-hour standard. The U.S. EPA has also revoked the annual and 24-hour standards because they will not add additional public health protection given the new 1-hour standard.

⁷ ARB has identified lead and vinyl chloride as TACs with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Sources: ARB 2013; U.S. EPA 2011

Table 3.3-2 Attainment Status Designations for Napa County

Pollutant	National Designation	State Designation
Ozone	Nonattainment	Nonattainment
PM ₁₀	Unclassified	Nonattainment
PM _{2.5}	Nonattainment	Nonattainment
CO	Unclassifiable/Attainment	Attainment
NO ₂	Unclassifiable/Attainment	Attainment
SO ₂	Unclassifiable/Attainment	Attainment
Lead (Particulate)	Unclassifiable/Attainment	Attainment
Hydrogen Sulfide	–	Unclassified
Sulfates	–	Attainment
Visibility Reducing Particulates	–	Unclassified

Notes: CO = carbon monoxide; NO₂ = nitrogen dioxide; PM_{2.5} = fine particulate matter; PM₁₀ = respirable particulate matter; SO₂ = sulfur dioxide
Source: ARB 2012a

Criteria Air Pollutants

The CAA required the U.S. EPA to establish national ambient air quality standards (NAAQS). Attainment status of the NAAQS for Napa County is shown in Table 3.3-2. As shown in Table 3.3-1, the U.S. EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO₂, SO₂, PM₁₀ and PM_{2.5}, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State implementation plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest agencies. The U.S. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If the U.S. EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basin.

Toxic Air Contaminants/Hazardous Air Pollutants

The U.S. EPA has programs for identifying and regulating hazardous air pollutants (HAPs). Title III of the CAAA directed to issue national emissions standards for HAPs (NESHAP). The NESHAP may be different for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be issued in two phases. In the first phase (1992–2000), the U.S. EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable and are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the U.S. EPA is required to issue emissions standards based on health risks where the standards are deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also requires the U.S. EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum for benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition,

Section 219 requires the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

STATE

CRITERIA AIR POLLUTANTS

ARB coordinates and oversees the state and local programs for controlling air pollution in California and implements the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires ARB to establish California ambient air quality standards (CAAQS) (Table 3.3-1) (ARB 2013). Attainment status for the CAAQS for Napa County is shown in Table 3.3-2. ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources. The act provides districts with the authority to regulate indirect sources.

ARB also oversees local air district compliance with federal and state laws, approving local air quality plans, submitting SIPs to the U.S. EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

TOXIC AIR CONTAMINANTS

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807 [Statutes of 1983]) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588 [Statutes of 1987]).

The Tanner Air Toxics Act sets forth a formal procedure for ARB to designate substances as TACs. This process includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. ARB has identified more than 21 TACs to date, including diesel particulate matter (diesel PM), and has adopted the U.S. EPA's list of HAPs as TACs. Once a TAC is identified, ARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there no safe threshold exists, the measure must incorporate BACT to minimize emissions.

The Hot Spots Information and Assessment Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions exceed designated levels, notify the public of significant risk levels, and prepare and implement risk reduction measures.

The Hot Spots Information and Assessment Act requires air districts to implement a program to inventory and prioritize stationary-source facilities that emit TACs (ARB 2008, 2011). As part of this program, each air district performs a screening analysis of every stationary source of TACs in its jurisdiction to determine whether the operator must perform a more detailed health risk assessment (HRA) that is based on dispersion modeling and site-specific topography and atmospheric conditions. If the HRA determines that the levels of health risk from a facility exceed designated risk levels for cancer and/or non-cancer risk, then the facility must notify all affected receptors and yet another set of risk levels is applied to determine if the facility must implement a Risk Reduction Audit and Plan to reduce its TAC emissions to the maximum extent feasible.

In addition, ARB has adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). Recent and upcoming milestones for transportation-related mobile sources include a low-sulfur diesel fuel requirement and tighter emissions standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be 75% less than the estimated year-2000 level in 2010 and 85% less in 2020. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

In addition, ARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB 2005) provides guidance concerning land use compatibility with TAC sources. While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to help keep children and other sensitive populations out of harm's way. A number of comments on the handbook were provided to ARB by air districts, other agencies, real estate representatives, and others. The comments included concern over whether ARB was playing a role in local land use planning, the validity of relying on static air quality conditions over the next several decades in light of technological improvements, and support for providing information that can be used in local decision making.

LOCAL

CRITERIA AIR POLLUTANTS

Bay Area Air Quality Management District

BAAQMD attains and maintains air quality conditions in Napa County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of BAAQMD includes the preparation of plans and programs for the attainment of ambient-air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. BAAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA, CAAA, and CCAA.

As mentioned above, BAAQMD adopts rules and regulations. All projects are subject to BAAQMD's rules and regulations in effect at the time of construction. Specific rules applicable to the construction activities under the alternatives being considered may include, but are not limited to:

- ▲ **Regulation 2, Rule 1, General Permit Requirements.** Includes criteria for issuance or denial of permits, exemptions, appeals against decisions of the Air Pollution Control Officer (APCO) and BAAQMD actions on applications.
- ▲ **Regulation 2, Rule 2, New Source Review.** Applies to new or modified sources and contains requirements for Best Available Control Technology and emission offsets. Rule 2 implements federal New Source Review and Prevention of Significant Deterioration requirements.
- ▲ **Regulation 5, Open Burning.** Generally prohibits open burning, but also allows for exemptions such as agricultural burning, disposal of hazardous materials, fire training, and range, forest, and wildlife management.

- ▲ **Regulation 6, Rule 1, General Requirements.** Limits the quantity of particulate matter in the atmosphere by controlling emission rates, concentration, visible emissions and opacity.
- ▲ **Regulation 7, Odorous Substances.** Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds. A person (or facility) must meet all limitations of this regulation, but meeting such limitations shall not exempt such person from any other requirements of BAAQMD, state, or national law. The limitations of this regulation shall not be applicable until BAAQMD receives odor complaints from ten or more complainants within a 90-day period, alleging that a person has caused odors perceived at or beyond the property line of such person and deemed to be objectionable by the complainants in the normal course of their work, travel, or residence. When the limits of this regulation become effective, as a result of citizen complaints described above, the limits shall remain effective until such time as no citizen complaints have been received by BAAQMD for one year. The limits of this Regulation shall become applicable again if BAAQMD receives odor complaints from five or more complainants within a 90-day period. BAAQMD staff investigate and track all odor complaints it receives and make attempts to visit the site and identify the source of the objectionable odor and assist the owner or facility in finding away to reduce the odor.
- ▲ **Regulation 8, Rule 3, Architectural Coatings.** Limits the quantity of volatile organic compounds in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within BAAQMD.
- ▲ **Regulation 11, Rule 2, Asbestos Demolition, Renovation, and Manufacturing.** Limits asbestos emissions during demolition or renovation of structures and the associated disturbance of asbestos-containing waste material generated or handled during these activities.

Air Quality Plans

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources.

For state air quality planning purposes, the Bay Area is classified as a serious non-attainment area for the one-hour ozone standard. The “serious” classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the Bay Area update the Clean Air Plan (CAP) every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The Bay Area’s record of progress in implementing previous measures must also be reviewed. Bay Area plans are prepared with the cooperation of the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). On September 15, 2010, the BAAQMD adopted the most recent revision to the Clean Air Plan - the Bay Area 2010 Clean Air Plan (BAAQMD 2010). The CAP serves to:

- ▲ update the *Bay Area 2005 Ozone Strategy* in accordance with the requirements of the CCAA to implement “all feasible measures” to reduce ozone;
- ▲ consider the impacts of ozone control measures on particulate matter, air toxics, and greenhouse gases in a single, integrated plan;
- ▲ review progress in improving air quality in recent years; and
- ▲ establish emission control measures to be adopted or implemented in the 2010 – 2012 timeframe.

Other ARB responsibilities include, but are not limited to, overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to the U.S. EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

Napa County General Plan

Napa County has various policies in place related to the improvement of air quality within the county. Policies relevant to the proposed project are shown below:

- ▲ **Policy CON-76.** The County shall minimize air pollutant emissions from all County facilities and operations to the extent feasible, consistent with the County's desire to provide a high level of public service.
- ▲ **Policy CON-77.** All new discretionary projects shall be evaluated to determine potential significant project-specific air quality impacts and shall be required to incorporate appropriate design, construction, and operational features to reduce emissions of criteria pollutants regulated by the state and federal governments below the applicable significance standard(s) or implement alternate and equally effective mitigation strategies consistent with BAAQMD's air quality improvement programs to reduce emissions.
- ▲ **Policy CON-80.** The County shall seek to reduce particulate emissions and avoid exceedences of state particulate matter (PM) standards by:
 - ▲ Requiring implementation of dust control measures during construction and grading
 - ▲ activities and enforcing winter grading deadlines.
- ▲ **Policy CON-81.** The County shall require dust control measures to be applied to construction projects consistent with measures recommended for use by the BAAQMD.
- ▲ **Policy CON-82.** The County shall require applicants seeking demolition permits to demonstrate compliance with any applicable BAAQMD requirements, particularly those related to asbestos-containing materials (ACMs) and exposure to lead paint.
- ▲ **Policy CON-83.** The County shall prepare and disseminate maps showing areas where soils are known to contain naturally occurring asbestos and shall require enhanced dust suppression measures for grading and construction projects in these areas consistent with BAAQMD requirements.
- ▲ **Policy CON-84.** The County shall require the establishment and maintenance of adequate buffer distances or filters or other equipment modifications for new sources of toxic air contaminants (TACs) and odors near proposed or existing sensitive receptors consistent with local and state regulatory requirements and guidelines.
- ▲ **Policy CON-85.** The County shall utilize construction emission control measures required by CARB or BAAQMD that are appropriate for the specifics of the project (e.g., length of time of construction and distance from sensitive receptors). These measures shall be made conditions of approval and/or adopted as mitigation to ensure implementation.

TOXIC AIR CONTAMINANTS

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under BAAQMD Regulation 2, Rule 1, General Permit Requirements and Regulation 2, Rule 2, New Source Review, all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new-source-review standards and air-toxics control measures. BAAQMD limits emissions and public exposure to TACs through a number of programs.

In order to implement the Hot Spots Information and Assessment Act in its jurisdiction, BAAQMD requires all stationary sources of TACs that are determined to generate an incremental increase in cancer risk that exceeds 1 in one million or a non-cancer chronic or acute risk level that exceeds a hazard index of 10 (using the conservative estimates of screening-level analysis) to perform a detailed HRA. Next, if the detailed HRA determines that the facility exposes receptors to a level of cancer risk greater than 100 in a million or a level of non-cancer risk that exceeds a hazard index of 10, then the facility must prepare a Risk Reduction Audit & Plan (ARB 2008, 2011).

3.3.2 ENVIRONMENTAL SETTING

The project site is located in Napa County, California, which is within the SFBAAB. The SFBAAB also includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara Counties; the western portion of Solano County and the southern portion of Sonoma County. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by the sources of air pollutants and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

Atmospheric conditions such as wind speed, wind direction and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The climate of the Bay Area is determined largely by a high-pressure system that is often present over the eastern Pacific Ocean. High-pressure systems are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, resulting in subsidence inversions. During summer and fall, locally generated emissions can, under the restraining influences of topography and subsidence inversions, cause conditions that are conducive to the formation of photochemical pollutants, such as ozone and secondary particulates (e.g., nitrates and sulfates). In the winter, the Pacific high pressure system shifts southward, allowing storms to pass through the area (BAAQMD 2012a).

The Napa Valley is bordered by relatively high mountains. With an average ridge line height of about 2,000 feet, with some peaks approaching 3,000 to 4,000 feet, these mountains are effective barriers to the prevailing northwesterly winds. The Napa Valley is widest at its southern end and narrows in the north. During the day, the prevailing winds flow upvalley from the south about half of the time. A strong upvalley wind frequently develops during warm summer afternoons, drawing air in from the San Pablo Bay. Daytime winds sometimes flow downvalley from the north. During the evening, especially in the winter, downvalley drainage often occurs. Wind speeds are generally low, with almost 50 percent of the winds less than 4 mph. Only 5% of the winds are between 16 and 18 mph, representing strong summertime upvalley winds and winter storms (BAAQMD 2012a).

The predominant wind direction in Napa is northwesterly. In Napa, the heaviest rainfall occurs between November and April. Summer average maximum temperatures are in the low-80's at the southern end of the valley and in the low 90's at the northern end. Winter average maximum temperatures are in the high-50's and low-60's, and minimum temperatures are in the high to mid-30's with the slightly cooler temperatures in the northern end (BAAQMD 2012a).

The air pollution potential in the Napa Valley could be high if there were sufficient sources of air contaminants nearby. Summer and fall prevailing winds can transport ozone precursors northward from the Carquinez Strait Region to the Napa Valley, effectively trapping and concentrating the pollutants when stable conditions are present. The local upslope and downslope flows created by the surrounding mountains may also recirculate pollutants already present, contributing to buildup of air pollution. High ozone concentrations are a potential problem to sensitive crops such as wine grapes, as well as to human health. The high frequency of light winds and stable conditions during the late fall and winter contribute to the buildup of particulate matter from motor vehicles, agriculture and wood burning in fireplaces and stoves.

EXISTING AIR QUALITY

CRITERIA AIR POLLUTANTS

Concentrations of emissions from criteria air pollutants are used to indicate the quality of the ambient air. A brief description of key criteria air pollutants in the SFBAAB is provided below. Emission source types, health effects are summarized in Table 3.3-3. Monitoring data applicable to the project site is provided in Table 3.3-4.

Table 3.3-3 Sources and Health Effects of Criteria Air Pollutants			
Pollutant	Sources	Acute ¹ Health Effects	Chronic ² Health Effects
Ozone	Secondary pollutant resulting from reaction of ROG and NO _x in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO _x results from the combustion of fuels	increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	headache, dizziness, fatigue, nausea, vomiting, death	permanent heart and brain damage
Nitrogen dioxide (NO ₂)	combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	chronic bronchitis, decreased lung function
Sulfur dioxide (SO ₂)	coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO ₂ exposure to chronic health impacts
Respirable particulate matter (PM ₁₀), Fine particulate matter (PM _{2.5})	fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of SO ₂ and ROG	breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	alterations to the immune system, carcinogenesis
Lead	metal processing	reproductive/developmental effects (fetuses and children)	numerous effects including neurological, endocrine, and cardiovascular effects

Notes: NO_x = oxides of nitrogen; ROG = reactive organic gases.
¹ "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.
² "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.
 Source: U.S. EPA 2012

Table 3.3-4 Summary of Annual Data on Ambient Air Quality (2010-2012)¹			
	2010	2011	2012
Ozone			
Maximum concentration (1-hr/8-hr avg, ppm)	0.106/0.089	0.083/0.069	0.082/0.064
Number of days state standard exceeded (1-hr/8-hr)	1/0	0/0	0/0
Number of days national standard exceeded (8-hr)	2	0	0
Fine Particulate Matter (PM_{2.5})			
Maximum concentration (µg/m ³)	26.6	33.2	25.7
Number of days national standard exceeded (measured ²)	0	0	0
Respirable Particulate Matter (PM₁₀)			
Maximum concentration (µg/m ³)	36.1	54.4	36.3
Number of days state standard exceeded (measured/calculated ²)	0/0	1/6	0/0
Number of days national standard exceeded (measured/calculated ²)	0/0	0/0	0/0
Notes: µg/m ³ = micrograms per cubic meter; ppm = parts per million			
¹ Measurements from the Napa-Jefferson Avenue station for Ozone and respirable particulate matter (PM ₁₀). Measurements of fine particulate matter (PM _{2.5}) obtained from the Santa Rosa-5 th Street air monitoring station.			
² Measured days are those days that an actual measurement was greater than the level of the State daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.			
Source: ARB 2012b			

Ozone

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of ROG and NO_x in the presence of sunlight. Reactive Organic Gas (ROG) are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. Oxides of Nitrogen (NO_x) are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Nitrogen Dioxide

Nitrogen dioxide (NO₂) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO₂ are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO₂. The combined emissions of NO and NO₂ are referred to as NO_x and are reported as equivalent NO₂. Because NO₂ is formed and depleted by reactions associated with photochemical smog (ozone), the NO₂ concentration in a particular geographical area may not be representative of the local sources of NO_x emissions (U.S. EPA 2012).

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM₁₀. PM₁₀ consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by reaction of gaseous precursors (ARB 2009). Fine particulate matter (PM_{2.5}) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less. PM₁₀ emissions in the SFBAAB are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from

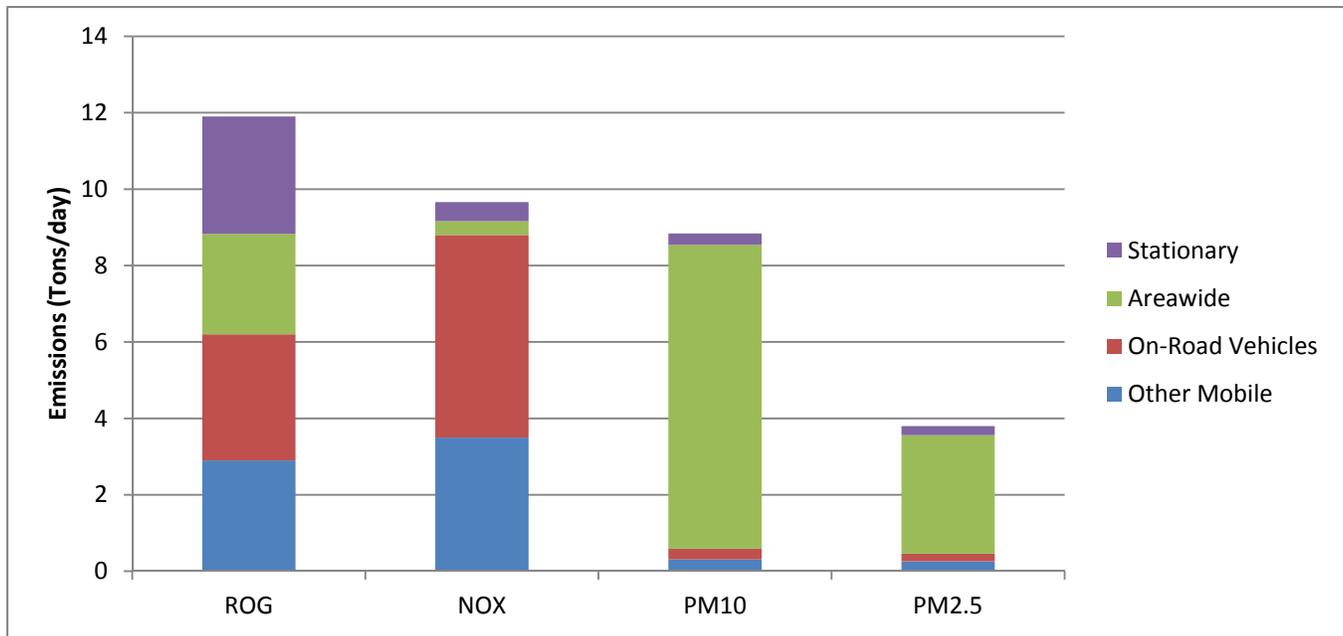
residential fuel combustion. Direct emissions of PM₁₀ have increased slightly over the last 20 years, and are projected to continue. PM_{2.5} emissions have remained relatively steady over the last 20 years and are projected to increase slightly through 2020. Emissions of PM_{2.5} in the SFBAAB are dominated by the same sources as emissions of PM₁₀ (ARB 2009).

MONITORING STATION DATA AND ATTAINMENT AREA DESIGNATIONS

The BAAQMD and ARB operate a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants within the Bay Area. Existing and probable future levels of air quality in Napa County can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its nearby monitoring stations. Napa currently has one monitoring station that measures criteria pollutants, including ozone, PM₁₀, CO, and NO₂. (City of Napa 2012:4B-17). Table 3.3-4 shows a three-year summary of monitoring data for ozone and PM₁₀, the main pollutants of concern, from the Napa station. In addition, PM_{2.5} monitoring data from the Santa Rosa station have been included as representative concentrations in a nearby urban locale in the BAAQMD jurisdiction. The table also compares these measured concentrations with state and federal ambient air quality standards. In Napa County, ozone and particulate matter are of the most problematic pollutants. (Napa County 2007:4.8-6).

EMISSIONS INVENTORY

Exhibit 3.3-1 summarizes emissions of criteria air pollutants within Napa County for various source categories. According to Napa County’s emissions inventory, mobile sources are the largest contributor to the estimated annual average for air pollutant levels of ROG and NO_x accounting for approximately 52% and 91% respectively, of the total emissions. Areawide sources account for approximately 90% and 82% of the County’s PM₁₀ and PM_{2.5} emissions, respectively (ARB 2010).



Source: ARB 2010

Exhibit 3.3-1

Napa County 2010 Emissions Inventory

TOXIC AIR CONTAMINANTS

Concentrations of TACs are also used to indicate the quality of ambient air. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality* (ARB 2009), the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being diesel PM. Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM₁₀ database, ambient PM₁₀ monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Based on receptor modeling techniques, ARB estimated its health risk to be 360 excess cancer cases per million people in the SVAB in the year 2000. Since 1990, the health risk associated with diesel PM has been reduced by 52%. Overall, levels of most TACs, except para-dichlorobenzene and formaldehyde, have decreased since 1990 (ARB 2009).

Existing sources of TACs in the project vicinity are primarily diesel PM from nearby State Route (SR) 221. Other sources of TACs include the adjacent Syar Napa Quarry and the proximate locomotive and tugboat activity along the Napa River. TAC-generating activities at the quarry include the operation of diesel-powered mining equipment and haul trucks, as well as all ground-disturbance activities that generate airborne dust, which can contain earth metals and silica.

ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor

intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Odor sources in the project area consist of equipment operating at the Syar Napa Quarry. Diesel exhaust, which some people regard as having an unpleasant odor, is generated on the western side of the quarry where offroad equipment is used to process aggregate and on-road haul trucks arrive to be loaded. Haul trucks travel along the haul route along the southern side of both the Boca parcel and Pacific Coast parcel. Offroad equipment operates in the processing area of the quarry which is centered approximately 400 feet east of the Boca parcel. Odors are also generated by the asphalt batch plant located in the processing area. Emissions generated by asphalt batch plants are often referred to as blue smoke generated by asphalt batch plants can result in odor complaints.

3.3.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

METHODS AND ASSUMPTIONS

Short-term construction-related and long-term operation-related (regional and local) impacts, as well as impacts from TACs and odors, were assessed in accordance with BAAQMD-recommended methodologies.

Project-specific data, such as an estimation of construction equipment onsite per month, daily construction workers, and daily truck deliveries was provided by the County (as summarized in Table 2-5 of Chapter 2, "Project Description"). Quantification of air pollutant emissions were based on a combination of methods, including the use of emission factors from the U.S. EPA published AP-42, exhaust emission factors from ARB's Off-Road Emissions Inventory Program and ARB's Emission Factor Computer Program. Project-generated emissions were modeled using emission factors from these sources and data provided in the project description to estimate reasonable worst-case conditions.

At this time, BAAQMD has not adopted a methodology for analyzing short-term construction-related emissions of TACs and does not recommended the completion of health risk assessments (HRAs) for such emissions, with a few exceptions (e.g., where construction phase is the only phase of project). Therefore, project-generated, construction-related emissions of TACs were assessed in a qualitative manner. Construction-related emissions of TACs were qualitatively analyzed based on the mass of PM_{2.5} exhaust emitted by heavy-duty construction equipment (which is considered a surrogate for diesel PM), the duration of equipment use at any single location, the size of the area in which construction activity would occur, and the proximity of nearby sensitive receptors. Long-term operational emissions of TACs were also qualitatively evaluated based on the types of new TAC sources that would be introduced (i.e., delivery trucks, backup diesel generators), the duration in which emissions would be generated in any single location for an extended period, and the proximity of sensitive receptors.

A full HRA was conducted using the U.S. EPA's Industrial Source Complex Short Term Model (Version 02035) in AERMOD View (Version 8.2.0, Lakes Environmental) and the risk module of ARB's Hotspots Analysis Reporting Program (HARP) (HARP Version 1.4f, build 23.11.0.1) (ARB 2012c) to determine whether the proposed project would be sited at a location where inmates and workers would be exposed to substantial levels of cancer risk, non-cancer chronic risk, or short-term acute risk. Input parameters used in the HRA were selected in accordance with guidance from BAAQMD (BAAQMD 2012a; BAAQMD 2012b) and the Office of Environmental Health Hazard Assessment (OEHHA) (OEHHA 2003). Refer to Appendix F for a copy of the full HRA prepared for this project.

It is not known at this time when future expansion would occur, or if it would occur at all. Therefore, for modeling purposes, to represent a worst-case construction and operational emissions it was assumed that the expansion would take place immediately after the initial construction of Phase 1 of 366 beds. This is a worst case

assumption because exhaust emission rates would improve in the future, resulting in lower exhaust emissions; thus, the closer in time to completion of Phase 1 that construction occurs, the higher the assumed emissions would result.

THRESHOLDS OF SIGNIFICANCE

BAAQMD's June 2010 adopted thresholds of significance were challenged in a lawsuit. On March 5, 2012 the Alameda County Superior Court issued a judgment finding that BAAQMD had failed to comply with CEQA when it adopted the thresholds. The court found that the adoption of the thresholds was a project under CEQA and ordered BAAQMD to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. The court issued a writ of mandate ordering BAAQMD to set aside the thresholds and cease dissemination of them until BAAQMD had complied with CEQA. The court's order permits BAAQMD to develop and disseminate these CEQA Guidelines, as long as they do not implement the thresholds of significance.

As discussed in BAAQMD's updated CEQA guide that was released in May 2012, an analysis of environmental impacts under CEQA includes an assessment of the nature and extent of each impact expected to result from the project to determine whether the impact will be treated as significant or less than significant. CEQA gives lead agencies discretion whether to classify a particular environmental impact as significant. Ultimately, formulation of a standard or "threshold" of significance requires the lead agency to make a policy judgment about where the line should be drawn distinguishing adverse impacts it considers significant from those that are not deemed significant. This judgment must, however, be based on scientific information and other factual data to the extent possible. (State CEQA Guidelines Section 15064[b]).

As discussed above, due to the existing court order on BAAQMD's adopted 2010 CEQA Thresholds of Significance, BAAQMD cannot recommend specific thresholds of significance for use by local governments at this time. BAAQMD states that lead agencies will need to determine appropriate air quality thresholds to use for each project they review based on substantial evidence that they should include in the administrative record for the project. One resource BAAQMD provides as a reference for determining appropriate thresholds is the CEQA Thresholds Options and Justification Report developed by staff in 2009 (BAAQMD 2009). The CEQA Thresholds Options and Justification Report outlines substantial evidence supporting a variety of thresholds of significance.

For the purposes of this project, the following thresholds of significance, as included in the aforementioned report unless otherwise noted, will be used to determine if an impact on air quality would be significant. The project would result in a significant air quality impact if it would:

- ▲ cause daily construction-generated criteria air pollutant or precursor emissions to exceed 54 lb/day for ROG, 54 lb/day for NO_x, 82 lb/day of PM₁₀ exhaust, or 54 lb/day of PM_{2.5} exhaust, or substantially contribute to emissions concentrations (e.g., PM₁₀) that exceed the NAAQS or CAAQS;
- ▲ cause daily long-term regional criteria air pollutant or precursor emissions to exceed of 54 lb/day for ROG and 54 lb/day for NO_x, 82 lb/day of PM₁₀ exhaust, or 54 lb/day of PM_{2.5} exhaust, or substantially contribute to emissions concentrations (e.g., PM₁₀) that exceed the NAAQS or CAAQS;
- ▲ not comply with BAAQMD's Best Management Practices for dust emissions (e.g., PM₁₀ and PM_{2.5})
- ▲ result in long-term operational local mobile-source CO emissions that would violate or contribute substantially to concentrations that exceed the California 1-hour ambient air-quality standard of 20 ppm or the 8-hour standard of 9 ppm;
- ▲ generate TAC emissions that would expose sensitive receptors to an incremental increase in cancer risk that exceeds 10 in one million and/or a hazard index of 1 ;
- ▲ locate sensitive receptors where they would be exposed to a combined level of cancer risk from nearby sources of TACs that exceeds 100 in one million and/or a combined hazard index of 10. This threshold is

consistent with the cumulative health risk threshold included in BAAQMDs CEQA Thresholds Options and Justification Report (BAAQMD 2009:5) as well as the prioritization scores BAAQMD uses to implement the Hot Spots Information and Assessment Act (ARB 2008, 2011); or

- ▲ create objectionable odors affecting a substantial number of people (e.g., five confirmed complaints per year averaged over three years).

ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

The types of air quality issues listed above are addressed in the analysis below. As described further in Chapter 4, many of the impacts analyzed below are inherently “cumulative” in the sense that the methodology used takes into consideration existing air quality conditions in the region, including emissions already occurring or projected to occur in the region.

IMPACT ANALYSIS

Impact 3.3-1	Short-term Construction-Generated Emissions of ROG, NO_x, PM₁₀ and PM_{2.5}. Short-term construction-generated emissions could exceed BAAQMD’s significance threshold for criteria air pollutants (e.g., ROG, NO _x , exhaust PM ₁₀ and PM _{2.5}) unless BAAQMD-Best Management Practices for dust control are implemented. Therefore, fugitive dust emissions could contribute to pollutant concentrations that exceed the NAAQS or CAAQS and would be inconsistent with the County’s policy (CON-77) requiring consistency with BAAQMD requirements. Therefore, this is a significant impact. This impact could be reduced to a less-than-significant level through implementation of Mitigation Measure 3.3-1.
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Construction emissions are described as “short-term” or temporary in duration and may represent a significant impact on air quality, especially in the case of PM₁₀. Construction-related activities would result in project-generated emissions of ROG, NO_x, PM₁₀ and PM_{2.5} (a subset of PM₁₀) from site preparation (e.g., excavation, clearing), off-road equipment, material delivery, and worker commute exhaust emissions, vehicle travel, and other miscellaneous activities (e.g., building construction, asphalt paving, application of architectural coatings). Fugitive dust emissions are associated primarily with site preparation and vary as a function of soil silt content, soil moisture, wind speed, acreage of disturbance, vehicle miles traveled (VMT) on- and off-site, and other factors. Ozone precursor emissions of ROG and NO_x are associated primarily with construction equipment exhaust and the application of architectural coatings.

Construction of the proposed project would include demolition of existing structures, construction of a new 366-bed jail facility (Phase 1) and future expansion of an additional 160 beds (Phase 2). Initial construction would begin in March 2016 and last approximately 24 months. It is not known at this time when the future expansion would occur. However, the 160-bed addition could take place in a second phase or simultaneously with the initial phase. To represent a worst-case construction emissions scenario it was assumed that the expansion would take place immediately after the initial construction of Phase 1. As previously stated, this approach is conservative because exhaust emission rates of both off-road equipment and on-road vehicles would decrease the further that construction occurs in the future, resulting in lower emissions.

Construction equipment would include earth-moving equipment, including graders, scrapers, backhoes, jackhammers, front-end loaders, generators, water trucks, and dump trucks, which would be used during excavation for utilities and building foundations. Concrete trucks and pumpers would be onsite during concrete pours for foundations and slabs; forklifts would be used during erection of walls and delivery of materials from storage yards; and cranes would be operated for installation of precast panels, structural steel framing members, and metal decking. No import or export of fill is anticipated.

Please see Appendix C for air quality modeling input and output parameters, detailed assumptions, and daily construction emissions estimates. Construction emissions are summarized in Table 3.3-5.

Based on the modeling conducted, short-term construction-related emissions for either of the project phases would not exceed BAAQMD's applicable thresholds of significance for any of the criteria air pollutants or precursors, including ROG, NO_x, PM₁₀ exhaust, or PM_{2.5} exhaust. Maximum daily emissions for all criteria air pollutants and precursors would occur during Phase 1 and would all be below BAAQMD's applicable thresholds. However, the BAAQMD's fugitive PM₁₀ and PM_{2.5} dust emissions could contribute to pollutant concentrations that exceed the NAAQS or CAAQS if dust control measures are not implemented. This would be inconsistent with BAAQMD's threshold requirements and would be inconsistent with County's policy (CON-77) requiring project's to be consistent with BAAQMD's requirements for air emissions. For these reasons this would be a **significant** impact.

Table 3.3-5 Summary of Maximum Modeled Emissions of Criteria Air Pollutants and Precursors Associated with Project Construction Activities (lb/day)						
	ROG	NO _x	PM ₁₀ (exhaust)	PM ₁₀ (dust)	PM _{2.5} (exhaust)	PM _{2.5} (dust)
Maximum Daily Emissions ¹						
Phase 1 (366 beds)	2	26	1	50	5	1
Phase 2 (160-bed expansion, 526 beds)	1	12	<1	2	<1	<1
BAAQMD Thresholds of Significance	54	54	82	BMPs/AAQS	54	BMPs/AAQS

Notes: Duration is based on 20 work days per month.
¹ Maximum daily emissions of criteria air pollutants were calculated based on total work hours per month and therefore the maximum daily emissions would occur on each day of the month during any given month of the entire construction period

AAQS = Ambient Air Quality Standards
 BAAQMD = Bay Area Air Quality Management District
 BMPs = Best Management Practices
 lb/day = pounds per day
 NA = not applicable
 NO_x = oxides of nitrogen
 PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less
 PM_{2.5} = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less
 ROG = reactive organic gases

Modeled values represent maximum daily emissions that would occur over the duration of the construction period. See Appendix C for detail on model inputs, assumptions, and project specific modeling parameters.
 Source: Modeling conducted by Ascent Environmental in 2013

Mitigation Measure 3.3-1. Implement Construction-Related Measures to Reduce Impacts from Fugitive Dust Emissions

The County will require its contractors to comply with the following construction-related measures to reduce impacts from fugitive dust emissions:

- › *All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day.*
- › *All haul trucks transporting soil, sand, or other loose material off-site will be covered.*
- › *All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.*
- › *All vehicle speeds on unpaved roads will be limited to 15 mph.*

- › *All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.*
- › *Idling times will 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 CCR). Clear signage will be provided for construction workers at all access points.*
- › *All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified visible emissions evaluator.*
- › *Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The Air District's phone number will also be visible to ensure compliance with applicable regulations.*
- › *Building pads shall be laid as soon as possible upon completion of grading, unless seeding or soil binders are used to minimize wind-generated fugitive dust emissions.*

Implementation of Mitigation Measure 3.3-5 would meet the BAAQMD's Best Management Practices threshold for emissions of PM₁₀ and PM_{2.5} fugitive dust and would further reduce fugitive dust emissions during project-related construction activities. Implementation of Mitigation Measure AQ-1 would reduce this impact to a **less-than-significant** level.

Impact	Long-term Operational-Generated Emissions of ROG, NO_x, PM₁₀ and PM_{2.5}.
3.3-2	Implementation of the proposed project would not result in long-term operational emissions of ROG, NO _x , PM ₁₀ , or PM _{2.5} that exceed BAAQMD's thresholds of significance (54 lb/day for ROG and NO _x , 82 lb/day for PM ₁₀ and 54 lb/day for PM _{2.5} exhaust) or substantially contribute to concentrations that exceed the NAAQS or CAAQS. This would be a less-than-significant impact.

Area-sources of emissions would include landscape equipment, such as mowers and leaf blowers, but their use and associated emissions would be relatively minor in comparison to mobile-source emissions associated with vehicle trips generated by the proposed project.

Project-generated mobile-source emissions of ROG, NO_x, PM₁₀, and PM_{2.5} were modeled based on trip generations rates as described in Section 3.9, "Transportation and Traffic." Mobile-source emissions of criteria air pollutants and ozone precursors would result from employee commute trips, visitor trips, and other associated vehicle trips (e.g., deliveries of supplies, maintenance vehicles). The facility would result in an estimated 554 daily trips, assuming the complete build out of 526 beds.

Table 3.3-6 summarizes the modeled project-generated, operation-related emissions of criteria air pollutants and ozone precursors. As shown in Table 3.3-6, operation-related activities would result in project-generated annual unmitigated emissions of ROG, NO_x, PM₁₀, and PM_{2.5} that are substantially below the BAAQMD-recommended thresholds of significance.

Assuming that the entire 526 bed facility would be built in the future, daily unmitigated long-term mobile-source emissions would not exceed BAAQMD's significance threshold of 54 lb/day for ROG or NO_x, 82 lb/day for PM₁₀ and 54 lb/day for PM_{2.5} exhaust and would not be expected to contribute to concentrations that exceed the NAAQS or CAAQS. As project-generated emissions of entire build out of the facility would not exceed applicable standards, neither would construction of just Phase 1. And as discussed above, stationary source emissions would have to comply with permitting processes; thus, this impact is considered **less than significant**.

Table 3.3-6 Summary of Maximum Modeled Operational Emissions of Criteria Air Pollutants and Precursors (lb/day)

	ROG	NO _x	PM ₁₀ (exhaust)	PM _{2.5} (exhaust)
Maximum Daily Emissions ¹	1	4	<1	<1
BAAQMD Thresholds of Significance	54	54	82	54

Notes: Duration is based on 20 work days per month
¹ Maximum daily emissions of criteria air pollutants were calculated based on total work hours per month and therefore the maximum daily emissions would occur on each day of the month during any given month of the entire construction period
AAQS = Ambient Air Quality Standards
BAAQMD = Bay Area Air Quality Management District
lb/day = pounds per day
NA = not applicable
NO_x = oxides of nitrogen
PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less
PM_{2.5} = respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less
ROG = reactive organic gases

Modeled values represent maximum daily emissions that would occur over the duration of the construction period. See Appendix C for detail on model inputs, assumptions, and project specific modeling parameters.
Source: Modeling conducted by Ascent Environmental in 2013

Impact 3.3-3 Mobile-Source CO Concentrations. Local mobile-source CO emissions near roadway intersections are a direct function of traffic volume, speed, and delay. Short-term, construction-and long-term operation of the proposed project would not result in increases in traffic such that the BAAQMD screening criteria would be triggered. Therefore, the project would not result in increased concentrations of CO that would expose sensitive receptors to unhealthy levels. This would be a *less-than-significant* impact.

Local mobile-source CO emissions near roadway intersections are a direct function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. However, under certain specific meteorological conditions, CO concentrations near roadways and/or intersections may reach unhealthy levels at nearby sensitive land uses, such as residential units, hospitals, schools, and childcare facilities. Thus, high local CO concentrations are considered to have a direct influence on the receptors they affect.

CO concentration is a direct function of vehicle idling time and, thus, traffic flow conditions. Under specific meteorological conditions, CO concentrations near congested roadways and/or intersections may reach unhealthy levels with respect to local sensitive land-uses such as residential areas, schools, and hospitals. As a result, it is recommended that CO not be analyzed at the regional level, but at the local level.

BAAQMD provides a screening methodology to determine project impacts from localized CO emissions. This screening methodology was utilized to analyze local CO emissions from the operation of this project. It states that the following criteria must be met:

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

Full build out (i.e., 526 beds) of the proposed project would not increase the population but would result in new full time employees (i.e., 74). In addition, based on the traffic study conducted, see Section 3.9, “Transportation and Traffic,” the project would not result in enough new daily peak hour trips to trigger any of the criteria discussed above. Implementation of Phase 1 only would result in fewer trips. As a result, the project (either Phase 1 alone or both Phases combined) would not result in increased concentrations of CO emissions such that any sensitive receptor would be exposed to unhealthy levels of CO. This impact would be **less than significant**.

Mitigation Measure

No mitigation is required.

Impact 3.3-4	Exposure of Sensitive Receptors to TACs. Short-term construction activities would not result in substantial emissions of diesel PM, would be relatively temporary (i.e., 24 months for initial construction and 13 months for future expansion), and would not be located in close proximity to off-site sensitive receptors (i.e., Napa State Hospital located approximately 1,300 feet to the north of the project site). TACs associated with long-term operations of the proposed project would be intermittent and also would not be located in close proximity to off-site sensitive receptors. Therefore, levels of TACs from project-related construction and operations would not result in an increase in health risk exposure at off-site sensitive receptors. In addition, inmates and workers at the project site would not be exposed to a level of cancer, chronic, or acute risk from the combination of nearby TAC sources that exceed applicable thresholds. This would be a <i>less-than-significant</i> impact.
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The exposure of sensitive receptors (e.g., existing and future off-site residents) to TAC emissions from project-generated construction and operational sources are discussed separately below, followed by an analysis of the exposure of the proposed project to TACs emitted by existing nearby sources.

SHORT-TERM CONSTRUCTION

Construction-related activities would result in temporary, short-term project-generated emissions of diesel PM from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., demolition, clearing, grading); paving; application of architectural coatings; and other miscellaneous activities.

Particulate exhaust emissions from diesel-fueled engines (i.e., diesel PM) was identified as a TAC by the ARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts (ARB 2003), so diesel PM is the focus of this discussion. Based on the emission modeling conducted and presented in Table 3.3-6 above, maximum daily emissions of PM_{2.5}, considered a surrogate for diesel PM, would not exceed 1 lb /day and, therefore would be less than BAAQMD’s threshold of 54 lb/day.

Additionally, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. According to OEHHA, HRAs, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project (OEHHA 2012:11-3). Consequently, it is important to consider that the use of off-road heavy-duty diesel equipment would be limited to the construction period, which would be approximately 24 months (less for the more equipment-intensive

phases). Also, studies show that DPM is highly dispersive (e.g., decrease of 70% at 500 feet from the source) (Zhu et al. 2002). The nearest existing off-site sensitive receptor, the Napa State Hospital, is located approximately 1,300 feet from the project site property and inmates would not be located on-site during the construction phase.

Therefore, considering the highly dispersive properties of diesel PM, the relatively low mass of diesel PM emissions that would be generated during project construction, the distance to the nearest off-site sensitive receptor, and the relatively short duration of construction activities, construction-related TAC emissions would not expose sensitive receptors to an incremental increase in cancer risk that exceeds 10 in one million or a hazard index greater than 1.0.

LONG-TERM OPERATION (OFFSITE IMPACTS)

The proposed project would include the long-term operation of sources of diesel PM, including diesel-powered delivery trucks and onsite diesel-fueled backup generators. It is not anticipated that more than 6 diesel-powered trucks would access the project on any given day. Also, delivery trucks typically would not leave their engines running for an extended length of time when onsite given that they are required to limit idling time to 5 minutes by the California airborne toxics control measure incorporated in Title 13, Section 2485 of CCR. The backup diesel generators would only be operated during power failures and for a few hours during periodic testing. Given that the level of diesel PM-generating activity on the project site would be relatively low, the distance to the nearest off-site sensitive receptor (i.e., Napa State Hospital, which is located approximately 1,300 feet north of the project site), and the highly dispersive properties of diesel PM, operation-related TAC emissions would not expose sensitive receptors to an incremental increase in cancer risk that exceeds 10 in one million or a hazard index greater than 1.0.

LONG-TERM ONSITE EXPOSURE

An HRA was performed to assess the combined level of health risk exposure to inmates and workers at the proposed jail from the multiple local TAC sources, including the Syar Napa Quarry located east of the project site, traffic on SR 221 located west of the project site, and locomotive and tugboat activity at the Napa River southwest of the site. For purposes of this analysis, projected future mining activity and materials transport were estimated consistent with Syar Napa Quarry's pending application with the County. This HRA was performed in accordance with guidance from both BAAQMD (BAAQMD 2012a; BAAQMD 2012b) and OEHHA (OEHHA 2003) to determine the levels of cancer risk, non-cancer chronic risk, and short-term acute risk that would occur on the project site. Air dispersion modeling was conducted using the U.S. EPA's Industrial Source Complex Short Term Model (Version 02035) in AERMOD View (Version 8.2.0, Lakes Environmental) and the risk module of ARB's Hotspots Analysis Reporting Program (HARP) (HARP Version 1.4f, build 23.11.0.1) (ARB 2012c) to determine the concentration levels at existing nearby sensitive receptors. The HRA analyzed TACs from equipment and truck exhaust at the quarry, earth metals and silica found in materials and dust produced by the quarry, TACs included in the combustion emissions and fugitive organics of the asphalt plant at the quarry, as well as TACs generated by vehicular traffic on SR 221 and locomotives and tugboats on the Napa River. TAC concentrations were estimated at outdoor activity areas on the project site at a receptor height of 1.5 meters in accordance with OEHHA recommendations (OEHHA 2012:2-19). Indoor concentrations were estimated using a receptor height of 7.3 meters, which is the estimated height of air intake to the buildings' heating, ventilation, and cooling systems. See Appendix F for detailed input parameters, dispersion modeling output, and risk calculations.

The HRA estimated the levels of cancer risk, non-cancer chronic risk, and acute risk exposure on both the Pacific Coast and Boca parcels. Risk isopleths around the project area are presented in Figures 5-14 in Attachment 1 of Appendix F. These figures show isopleths for the combined level of risk at both receptor heights resulting from

the nearby TAC sources, as well as the locations of the project's various buildings and outdoor recreation areas on both the Pacific Coast and Boca parcels.

The HRA's cancer risk estimations conservatively assume that any single inmate could be housed at the facility for a period of up to 52 years (i.e., ages 18–70) and a worker could remain employed at the facility for up to 40 years. The assumptions about the duration of an inmate's or worker's presence on the project site are conservative because few inmates, if any, would be kept at the proposed jail for 52 years. Similarly, it is not expected that many workers, if any, would be employed at the proposed jail for 40 years. These assumptions are also important because dose is a function of the duration of exposure to TACs as well as their concentration in the environment.

Levels of cancer risk exposure in the outdoor recreational areas adjacent to the main building where inmates would be housed, as well as at the air intakes of these buildings, on both parcels, would be less than the threshold of 100 in a million (as shown in Figures 5 and 6 of the HRA in Appendix F). The level of outdoor cancer risk exposure on the southeast portion of both parcels would exceed 100 in a million, as shown in Figure 5, including the location where the staff-secure residential facility is proposed on the Pacific Coast parcel and the location where the staff-secure residential facility and the 8,000 square-foot facility services building would be located on the Boca parcel. Though the isopleths indicated that level of cancer risk would exceed 100 in a million at the staff-secure residential facility, there are a few reasons that the cancer risk levels estimated for these areas grossly overstate the level of exposure to inmates. First, the levels of cancer risk for outdoor exposure assume that inmates would be outside 24 hours per day but inmates would be permitted to be outside onsite for no more than a few hours per day. Second, inmates would not be allowed the facility services building for any length of time and a majority of the inmates would not be housed in the staff-secure facility for more than 6 months (half year). In other words, the risk isopleths in Figure 5 indicate that an inmate residing at the staff-secure residential facility could be subject to an outdoor cancer risk level of up to 200 in a million only if the inmate was housed there for a 52-year period. (The indoor level of cancer risk would be lower, as shown in Figure 6.) An inmate housed in this building for only a one year would be subject to a pro-rated level of cancer risk of approximately 4 in a million if he or she spent all of the time outside, well below the accepted threshold.

The levels of outdoor and indoor cancer risk for workers would not exceed 100 in a million in any areas of the Pacific Coast or Boca parcels, as shown by the risk isopleths in Figures 7 and 8 of the HRA in Appendix F. The HRA also determined that the cumulative level of chronic risk and acute risk to which inmates would be exposed would not exceed a hazard index of 10 anywhere on the Pacific Coast or Boca parcels, as shown in Figures 9-14 of the HRA in Appendix F.

In summary, project-related construction and operational activities would not expose nearby, off-site sensitive receptors to incremental increases in cancer, chronic, and acute risk that exceed applicable thresholds. Additionally, inmates and workers at the project site, whether on the Pacific Coast or Boca parcels, would not be exposed to cumulative levels of cancer risk that exceed 100 in a million or cumulative levels of chronic or acute risk that exceed a hazard index of 10. Therefore, the levels of health risk exposure to inmates and workers on the project site would be **less than significant**.

Mitigation Measure

No mitigation is required.

Impact 3.3-5	Exposure of Sensitive Receptors to Odors. The proposed project would not result in any new sources of odor into the area nor locate workers and inmates where they would be exposed to substantial objectionable odors. Therefore, this impact would be considered <i>less than significant</i> .
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The occurrence and severity of odor impacts depends on numerous factors, including: the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and regulatory agencies. Projects with the potential to frequently expose a substantial number of members of the public to objectionable odors would be deemed to have a significant impact.

Minor odors from the use of heavy duty diesel equipment and the laying of asphalt during project-related construction activities would be intermittent and temporary, and would dissipate rapidly from the source with an increase in distance. Operation of the proposed project would include diesel-fueled delivery trucks hauling materials to and from the jail; however, this type of source is not different from the trucks that currently make trips to and from the Pacific Coast and Boca parcels. Operation of the jail would also include a cafeteria kitchen but any odors potential generated by the kitchen are not typically considered to be objectionable.

Implementation of the proposed project would locate workers and inmates in proximity to some existing odor sources that are associated with operations at the Syar Napa Quarry. As discussed in the setting above, diesel exhaust is generated on the western side of the quarry where offroad equipment processes aggregate and on-road haul trucks arrive to be loaded. Haul trucks travel along the haul route along the southern side of both the Boca parcel and Pacific Coast parcel. Offroad equipment operates in the processing area of the quarry which is centered approximately 400 feet east of the Boca parcel. Given that diesel emissions disperse rapidly with distance from the source (Zhu and Hinds 2002), it is not anticipated that odors from diesel equipment would result in the frequent exposure of receptors to objectionable odorous emissions.

Odors are also generated by the asphalt batch plant located in the processing area. Emissions generated by asphalt batch plants are often referred to as blue smoke and can result in odor complaints depending on site conditions and wind direction. A records query by BAAQMD staff of complaints associated with the Syar Napa Quarry from 2003 to present indicates that there have been no documented odor complaints associated with quarry operations, confirmed, unconfirmed, or pending (Reed, pers. comm., 2013). Given that there are no documented odor complaints about the Syar Napa Quarry over the last ten years, including by workers located on the Pacific Coast and Boca parcels, it is not anticipated that locating the proposed project on either the Pacific Coast or Boca parcels would result in future odor complaints. Thus, project implementation would not create objectionable odors affecting a substantial number of people. As a result, this impact would be **less than significant**.

Mitigation Measure

No mitigation is required.