4.2 AIR QUALITY

This chapter describes the existing air quality setting and evaluates the potential environmental impacts that could occur by adopting and implementing the San Leandro Shoreline Development (Project). "Emissions" refers to the actual quantity of pollutant, measured in pounds per day or tons per year. "Concentrations" refers to the amount of pollutant material per volumetric unit of air. Concentrations are measured in parts per million (ppm), parts per billion (ppb), or micrograms per cubic meter ($\mu g/m^3$).

This chapter is based on the methodology recommended by the Bay Area Air Quality Management District (BAAQMD) for project-level review, based on preliminary information available. The analysis contained herein focuses on air pollution from regional emissions and localized pollutant concentrations from buildout of the Project. Transportation sector emissions are based on trip generation provided by Kittelson & Associates, Inc. Criteria air pollutant emissions modeling is included in Appendix D, *Air Quality and Greenhouse Gas Modeling*, of this Draft EIR. A health risk assessment (HRA) for construction and operational phases of the Project is included in Appendix E, *Health Risk Assessment*, of this Draft EIR.

4.2.1 ENVIRONMENTAL SETTING

California is divided geographically into air basins for the purpose of managing the air resources of the State on a regional basis. An air basin generally has similar meteorological and geographic conditions throughout. The State is divided into 15 air basins. San Leandro is in the San Francisco Bay Area Air Basin (SFBAAB or Air Basin). The discussion below identifies the natural factors in the Air Basin that affect air pollution. Air pollutants of concern are criteria air pollutants and toxic air contaminants (TACs). Federal, State, and local air districts have adopted laws and regulations intended to control and improve air quality. The regulatory framework that is potentially applicable to the Project is also summarized below.

4.2.1.1 SAN FRANCISCO AIR BASIN

The BAAQMD is the regional air quality agency for the Air Basin, which comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties; the southern portion of Sonoma County; and the southwestern portion of Solano County. Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions.[1]

Meteorology

The Air Basin is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The Coast Range[2] splits in the Bay Area, creating a western coast gap, the Golden Gate, and an eastern coast gap, the Carquinez Strait, which allows air to flow in and out of the Bay Area and the Central Valley.

[1] This section describing the air basin is from Bay Area Air Quality Management District, 2010 (Revised 2011), Appendix C: Sample Air Quality Setting, in *California Environmental Quality Act Air Quality Guidelines*.

[2] The Coast Ranges traverses California's west coast from Humboldt County to Santa Barbara County.

AIR QUALITY

The climate is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell. During the summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below the surface because of the northwesterly flow produces a band of cold water off the California coast.

The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold water band, resulting in condensation and the presence of fog and stratus clouds along the Northern California coast. In the winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in a low air pollution potential.

Wind Patterns

During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately south of Mount Tamalpais in Marin County, the northwesterly winds accelerate considerably and come more directly from the west as they stream through the Golden Gate. This channeling of wind through the Golden Gate produces a jet that sweeps eastward and splits off to the northwest toward Richmond and to the southwest toward San Jose where it meets the East Bay hills.

Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait, the Golden Gate, or the San Bruno gap. For example, the average wind speed at the San Francisco International Airport in July is about 17 knots (from 3:00 p.m. to 4:00 p.m.), compared with only 7 knots at San Jose and less than 6 knots at the Farallon Islands.

The air flowing in from the coast to the Central Valley, called the sea breeze, begins developing at or near ground level along the coast in late morning or early afternoon. As the day progresses, the sea breeze layer deepens and increases in velocity while spreading inland. The depth of the sea breeze depends in large part upon the height and strength of the inversion. Under normal atmospheric conditions, the air in the lower atmosphere is warmer than the air above it. An inversion is a change in the normal conditions that causes the temperature gradient to be reversed or inverted. If the inversion is low and strong, hence stable, the flow of the sea breeze will be inhibited, and stagnant conditions are likely to result.

In the winter, the Air Basin frequently experiences stormy conditions with moderate to strong winds as well as periods of stagnation with very light winds. Winter stagnation episodes (i.e., conditions where there is little mixing, which occur when there is a lack of or little wind) are characterized by nighttime drainage flows in coastal valleys. Drainage is a reversal of the usual daytime air-flow patterns; air moves from the Central Valley toward the coast and back down toward the Bay from the smaller valleys within the Air Basin.

Temperature

Summertime temperatures in the Air Basin are determined in large part by the effect of differential heating between land and water surfaces. Because land tends to heat up and cool off more quickly than water, a large-scale gradient (differential) in temperature is often created between the coast and the

Central Valley, and small-scale local gradients are often produced along the shorelines of the ocean and bays. The temperature gradient near the ocean is also exaggerated, especially in summer, because of the upwelling of cold water from the ocean bottom along the coast. On summer afternoons, the temperatures at the coast can be 35 degrees Fahrenheit cooler than temperatures 15 to 20 miles inland; at night, this contrast usually decreases to less than 10 degrees Fahrenheit.

In the winter, the relationship of minimum and maximum temperatures is reversed. During the daytime the temperature contrast between the coast and inland areas is small, whereas at night the variation in temperature is large.

Precipitation

The Air Basin is characterized by moderately wet winters and dry summers. Winter rains (November through March) account for about 75 percent of the average annual rainfall. The amount of annual precipitation can vary greatly from one part of the Air Basin to another, even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys.

During rainy periods, ventilation (rapid horizontal movement of air and injection of cleaner air) and vertical mixing (an upward and downward movement of air) are usually high, and thus pollution levels tend to be low (i.e., air pollutants are dispersed more readily into the atmosphere rather than accumulating under stagnant conditions). However, during the winter, frequent dry periods do occur where mixing and ventilation are low and pollutant levels build up.

Wind Circulation

Low wind speed contributes to the buildup of air pollution because it allows more pollutants to be emitted into the air mass per unit of time. Light winds occur most frequently during periods of low sun (fall and winter, and early morning) and at night. These are also periods when air pollutant emissions from some sources are at their peak, namely, commuter traffic (early morning) and wood-burning appliances (nighttime). The problem can be compounded in valleys when weak flows carry the pollutants up-valley during the day and cold air drainage flows move the air mass down-valley at night. Such restricted movement of trapped air provides little opportunity for ventilation and leads to buildup of pollutants to potentially unhealthful levels.

Inversions

As described above, an inversion is a layer of warmer air over a layer of cooler air. Inversions significantly affect air quality conditions because they influence the mixing depth (i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground). There are two types of inversions that occur regularly in the Air Basin. Elevation inversions[3] are more common in the summer and fall, and

[3] When the air blows over elevated areas, it is heated as it is compressed into the side of the hill/mountain. When that warm air comes over the top, it is warmer than the cooler air of the valley.

radiation inversions[4] are more common during the winter. The highest air pollutant concentrations in the Air Basin generally occur during inversions.

4.2.1.2 AIR POLLUTANTS OF CONCERN

A substance in the air that can cause harm to humans and the environment is known as an air pollutant. Pollutants can be in the form of solid particles, liquid droplets, or gases. In addition, they may be natural or man-made. Pollutants can be classified as primary or secondary. Usually, primary pollutants are directly emitted from a process, such as ash from a volcanic eruption, carbon monoxide gas from a motor vehicle exhaust, or sulfur dioxide released from factories. Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact.

Criteria Air Pollutants

The pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and State law. Air pollutants are categorized as primary and/or secondary pollutants. Primary air pollutants are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NO_x), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb) are primary air pollutants. Of these, CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ are "criteria air pollutants," which means that ambient air quality standards (AAQS) have been established for them. ROG and NO_x are criteria pollutant precursors that form secondary criteria air pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants. Areas that meet AAQS are classified attainment areas, and areas that do not meet these standards are classified nonattainment areas.

A description for each of the primary and secondary criteria air pollutants and their known health effects is presented below.

- Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. CO is a primary criteria air pollutant. CO concentrations tend to be the highest during winter mornings with little or no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, motor vehicles operating at slow speeds are the primary source of CO in the Air Basin. Emissions are highest during cold starts, hard acceleration, stop-and-go driving, and when a vehicle is moving at low speeds. New findings indicate that CO emissions per mile are lowest at about 45 miles per hour (mph) for the average light-duty motor vehicle and begin to increase again at higher speeds. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces its oxygen-carrying capacity. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death.[5] The

[4] During the night, the ground cools off, radiating the heat to the sky.

[5] Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011), Appendix C: Sample Air Quality Setting, in California Environmental Quality Act Air Quality Guidelines.

Air Basin is designated under the California and National AAQS as being in attainment of CO criteria levels.[6]

- **Reactive Organic Gases (ROGs)** are compounds composed primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of ROGs. Other sources of ROGs include evaporative emissions from paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROGs, but rather by reactions of ROGs to form secondary pollutants such as O_3. There are no AAQS established for ROGs. However, because they contribute to the formation of O_3, BAAQMD has established a significance threshold for this pollutant.
- **Nitrogen Oxides (NO_x)** are a by-product of fuel combustion and contribute to the formation of O_3, PM_{10}, and $PM_{2.5}$. The two major components of NO_x are nitric oxide (NO) and nitrogen dioxide (NO_2). The principal component of NO_x produced by combustion is NO, but NO reacts with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and in equal concentrations is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 ppm. NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure.[7] The Air Basin is designated an attainment area for NO_2 under the National and California AAQS.[8]
- **Sulfur Dioxide (SO_2)** is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. It enters the atmosphere as a result of burning high-sulfur-content fuel oils and coal and from chemical processes at chemical plants and refineries. Gasoline and natural gas have very low sulfur content and do not release significant quantities of SO_2. When SO_2 forms sulfates (SO_4) in the atmosphere, together these pollutants are referred to as sulfur oxides (SO_x). Thus, SO_2 is both a primary and secondary criteria air pollutant. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. At lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue.[9] The Air Basin is designated an attainment area for SO_2 under the California and National AAQS.[10]
- **Suspended Particulate Matter (PM_{10} and $PM_{2.5}$)** consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM_{10}, include the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 millionths of a meter or 0.0004-inch) or less. Inhalable fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns or less (i.e., 2.5 millionths of a meter or 0.0001 inch).

[6] California Air Resources Board (CARB), 2014, Area Designations: Activities and Maps, http://www.arb.ca.gov/desig/adm/adm.htm, June.

[7] Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011). Appendix C: Sample Air Quality Setting, in California Environmental Quality Act Air Quality Guidelines.

[8] California Air Resources Board (CARB), 2014, Area Designations: Activities and Maps, http://www.arb.ca.gov/desig/adm/adm.htm, June.

[9] Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011). Appendix C: Sample Air Quality Setting, in California Environmental Quality Act Air Quality Guidelines.

[10] California Air Resources Board (CARB), 2014, Area Designations: Activities and Maps, http://www.arb.ca.gov/desig/adm/adm.htm, June.

Some particulate matter, such as pollen, occurs naturally. In the Air Basin most particulate matter is caused by combustion, factories, construction, grading, demolition, agricultural activities, and motor vehicles. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. PM_{10} bypasses the body's natural filtration system more easily than larger particles and can lodge deep in the lungs. The U.S. Environmental Protection Agency (EPA) scientific review concluded that $PM_{2.5}$ penetrates even more deeply into the lungs, and this is more likely to contribute to health effects—at concentrations well below current PM_{10} standards. These health effects include premature death in people with heart or lung disease, non-fatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms (e.g., irritation of the airways, coughing, or difficulty breathing). Motor vehicles are currently responsible for about half of particulates in the Air Basin. Wood burning in fireplaces and stoves is another large source of fine particulates.[11]

Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems. These health effects include premature death; increased hospital admissions and emergency room visits (primarily the elderly and individuals with cardiopulmonary disease); increased respiratory symptoms and disease (children and individual with asthma); and alterations in lung tissue and structure and in respiratory tract defense mechanisms.[12] There has been emerging evidence that even smaller particulates with an aerodynamic diameter of <0.1 microns or less (i.e., ≤0.1 millionths of a meter or <0.000004 inch), known as ultrafine particulates (UFPs), have human health implications, because UFPs toxic components may initiate or facilitate biological processes that may lead to adverse effects to the heart, lungs, and other organs. However, the EPA and California Air Resources Board have yet to adopt AAQS to regulate these particulates. Diesel particulate matter (DPM) is also classified a carcinogen by the CARB. The Air Basin is designated nonattainment under the California AAQS for PM_{10} and nonattainment under both the California and National AAQS for $PM_{2.5}$.[13,14]

- **Ozone (O_3)** is commonly referred to as "smog" and is a gas that is formed when ROGs and NO_x, both by-products of internal combustion engine exhaust, undergo photochemical reactions in the presence of sunlight. O_3 is a secondary criteria air pollutant. O_3 concentrations are generally highest during the summer months when direct sunlight, light winds, and warm temperatures create favorable conditions to the formation of this pollutant. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. O_3 levels usually build up during the day and peak in the afternoon hours. Short-term exposure can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, it can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Chronic exposure to high ozone levels can permanently damage

[11] Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011). Appendix C: Sample Air Quality Setting, in California Environmental Quality Act Air Quality Guidelines.

[12] South Coast Air Quality Management District (SCAQMD), 2005. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning.

[13] California Air Resources Board (CARB), 2014, Area Designations: Activities and Maps, http://www.arb.ca.gov/desig/adm/adm.htm, June.

[14] On January 9, 2013, the EPA issued a final rule to determine that the SFBAAB has attained the 24-hour $PM_{2.5}$ National AAQS. This action suspends federal State Implementation Plan planning requirements for the Bay Area. The SFBAAB will continue to be designated nonattainment for the National 24-hour $PM_{2.5}$ standard until such time as BAAQMD elects to submit a redesignation request and a maintenance plan to EPA and EPA approves the proposed redesignation.

lung tissue. O_3 can also damage plants and trees and materials such as rubber and fabrics.[15] The Air Basin is designated nonattainment of the 1-hour California AAQS and 8-hour California and National AAQS for O_3.[16]

- **Lead (Pb)** is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

  Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.[17] The Air Basin is designated in attainment of the California and National AAQS for lead.[18] Because emissions of lead are found only in projects that are permitted by BAAQMD, lead is not an air quality of concern for the Project.

Toxic Air Contaminants

Public exposure to TACs is a significant environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The California Health and Safety Code define a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant pursuant to Section 112(b) of the federal Clean Air Act (42 U.S. Code Section 7412[b]) is a toxic air contaminant. Under State law, the California Environmental Protection Agency (Cal/EPA), acting through CARB, is authorized to identify a substance as a TAC if it is an air pollutant that may cause or contribute to an increase in mortality or serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act sets up a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance (i.e., a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to

[15] Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011). Appendix C: Sample Air Quality Setting, in California Environmental Quality Act Air Quality Guidelines.

[16] California Air Resources Board (CARB), 2014, Area Designations: Activities and Maps, http://www.arb.ca.gov/desig/adm/adm.htm, June.

[17] Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011). Appendix C: Sample Air Quality Setting, in California Environmental Quality Act Air Quality Guidelines.

[18] California Air Resources Board (CARB), 2014, Area Designations: Activities and Maps, http://www.arb.ca.gov/desig/adm/adm.htm, June.

minimize emissions. To date, CARB has established formal control measures for 11 TACs that are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987. Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment (HRA), and if specific thresholds are exceeded, are required to communicate the results to the public through notices and public meetings.

At the time of the last update to the TAC list in December 1999, CARB had designated 244 compounds as TACs.[19] Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

In 1998, CARB identified diesel particulate matter (DPM) as a TAC. Previously, the individual chemical compounds in diesel exhaust were considered TACs. Almost all diesel exhaust particles are 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs.

4.2.1.3 REGULATORY FRAMEWORK

Federal and State Regulations

Ambient Air Quality Standards

The Clean Air Act (CAA) was passed in 1963 by the U.S. Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The CAA allows states to adopt more stringent standards or to include other pollution species specifics. The California Clean Air Act, signed into law in 1988, requires all areas of the State to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS.

The National and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect "sensitive receptors" most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

[19] California Air Resources Board (CARB), 1999. Final Staff Report: Update to the Toxic Air Contaminant List.

Both California and the federal government have established health-based AAQS for seven air pollutants, which are shown in Table 4.2-1. These pollutants are ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Regional Regulations

Bay Area Air Quality Management District

BAAQMD is the agency responsible for assuring that the National and California AAQS are attained and maintained in the Air Basin. BAAQMD is responsible for:

- Adopting and enforcing rules and regulations concerning air pollutant sources.
- Issuing permits for stationary sources of air pollutants.
- Inspecting stationary sources of air pollutants.
- Responding to citizen complaints.
- Monitoring ambient air quality and meteorological conditions.
- Awarding grants to reduce motor vehicle emissions.
- Conducting public education campaigns.
- Air Quality Management Planning.

Air quality conditions in the Air Basin have improved significantly since the BAAQMD was created in 1955.[20] The BAAQMD prepares air quality management plans (AQMPs) to attain ambient air quality standards in the Air Basin. The BAAQMD prepares ozone attainment plans for the National O_3 standard and clean air plans for the California O_3 standard. The BAAQMD prepares these AQMPs in coordination with Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC). The most recently adopted comprehensive plan is the 2010 Bay Area Clean Air Plan, which was adopted by BAAQMD on September 15, 2010, and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools.

BAAQMD 2010 Bay Area Clean Air Plan

The purpose of the 2010 Bay Area Clean Air Plan is to: 1) update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement all feasible measures to reduce O_3; 2) consider the impacts of O_3 control measures on PM, TAC, and greenhouse gases (GHGs) in a single, integrated plan; 3) review progress in improving air quality in recent years; and 4) establish emission control measures in the 2009 to 2012 timeframe. The 2010 Bay Area Clean Air Plan also provides the framework for the Air Basin to achieve attainment of the California and National AAQS.

[20] Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011). Appendix C: Sample Air Quality Setting, in California Environmental Quality Act Air Quality Guidelines.

AIR QUALITY

TABLE 4.2-1 AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Major Pollutant Sources
Ozone (O_3)	1 hour	0.09 ppm	*	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.070 ppm	0.075 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Average	0.030 ppm	0.053 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	*	*[a]	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm	
	24 hours	0.04 ppm	*[a]	
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	*	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	50 µg/m^3	150 µg/m^3	
Respirable Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	*	35 µg/m^3	
Lead (Pb)	30-Day Average	1.5 µg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarterly	*	1.5 µg/m^3	
	Rolling 3-Month Average	*	0.15 µg/m^3	
Sulfates (SO_4)	24 hours	25 µg/m^3	*	Industrial processes.
Visibility Reducing Particles	8 hours	ExCo =0.23/km visibility of 10≥ miles	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard	Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.

TABLE 4.2-1 AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Major Pollutant Sources
Vinyl Chloride	24 hour	0.01 ppm	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydro-carbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Notes: ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter
* Standard has not been established for this pollutant/duration by this entity.
a. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked.
Source: California Air Resources Board, 2013, Ambient Air Quality Standards, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, June.

BAAQMD Community Air Risk Evaluation Program

The BAAQMD's Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposure to outdoor TACs in the Bay Area. Based on findings of the latest report, Diesel Particulate Matter (DPM) was found to account for approximately 85 percent of the cancer risk from airborne toxics. Carcinogenic compounds from gasoline-powered cars and light duty trucks were also identified as significant contributors: 1,3-butadiene contributed four percent of the cancer risk-weighted emissions, and benzene contributed three percent. Collectively, five compounds—diesel PM, 1,3-butadiene, benzene, formaldehyde, and acetaldehyde—were found to be responsible for more than 90 percent of the cancer risk attributed to emissions. All of these compounds are associated with emissions from internal combustion engines. The most important sources of cancer risk-weighted emissions were combustion-related sources of DPM, including on-road mobile sources (31 percent), construction equipment (29 percent), and ships and harbor craft (13 percent). A 75 percent reduction in DPM was predicted between 2005 and 2015 when the inventory accounted for CARB's diesel regulations. Overall, cancer risk from TACs dropped by more than 50 percent between 2005 and 2015, when emissions inputs accounted for state diesel regulations and other reductions.[21]

Modeled cancer risks from TACs in 2005 were highest near sources of DPM: near core urban areas, along major roadways and freeways, and near maritime shipping terminals. Peak modeled risks were found to be located east of San Francisco, near West Oakland, and the Maritime Port of Oakland. BAAQMD has identified seven impacted communities in the Bay Area:

- Western Contra Costa County and the cities of Richmond and San Pablo
- Western Alameda County along the Interstate 880 (I-880) corridor and the cities of Berkeley, Alameda, Oakland, San Leandro, and Hayward
- San Jose
- Eastern side of San Francisco
- Concord

[21] Bay Area Air Quality Management District (BAAQMD), 2014. Improving Air Quality & Health in Bay Area Communities, Community Air Risk Program (CARE) Retrospective & Path Forward (2004 – 2013). April

- Vallejo
- Pittsburgh and Antioch

As illustrated in Figure 4.2-1, the majority of the City of San Leandro, including the Project site, lies within the Western Alameda County impacted community.

The major contributor to acute and chronic non-cancer health effects in the Air Basin is acrolein (C_3H_4O). Major sources of acrolein are on-road mobile sources and aircraft, and areas with high acrolein emissions are near freeways and commercial and military airports.[22] Currently CARB does not have certified emission factors or an analytical test method for acrolein. Since the appropriate tools needed to implement and enforce acrolein emission limits are not available, the BAAQMD does not conduct health risk screening analysis for acrolein emissions.[23]

Alameda County Transportation Commission

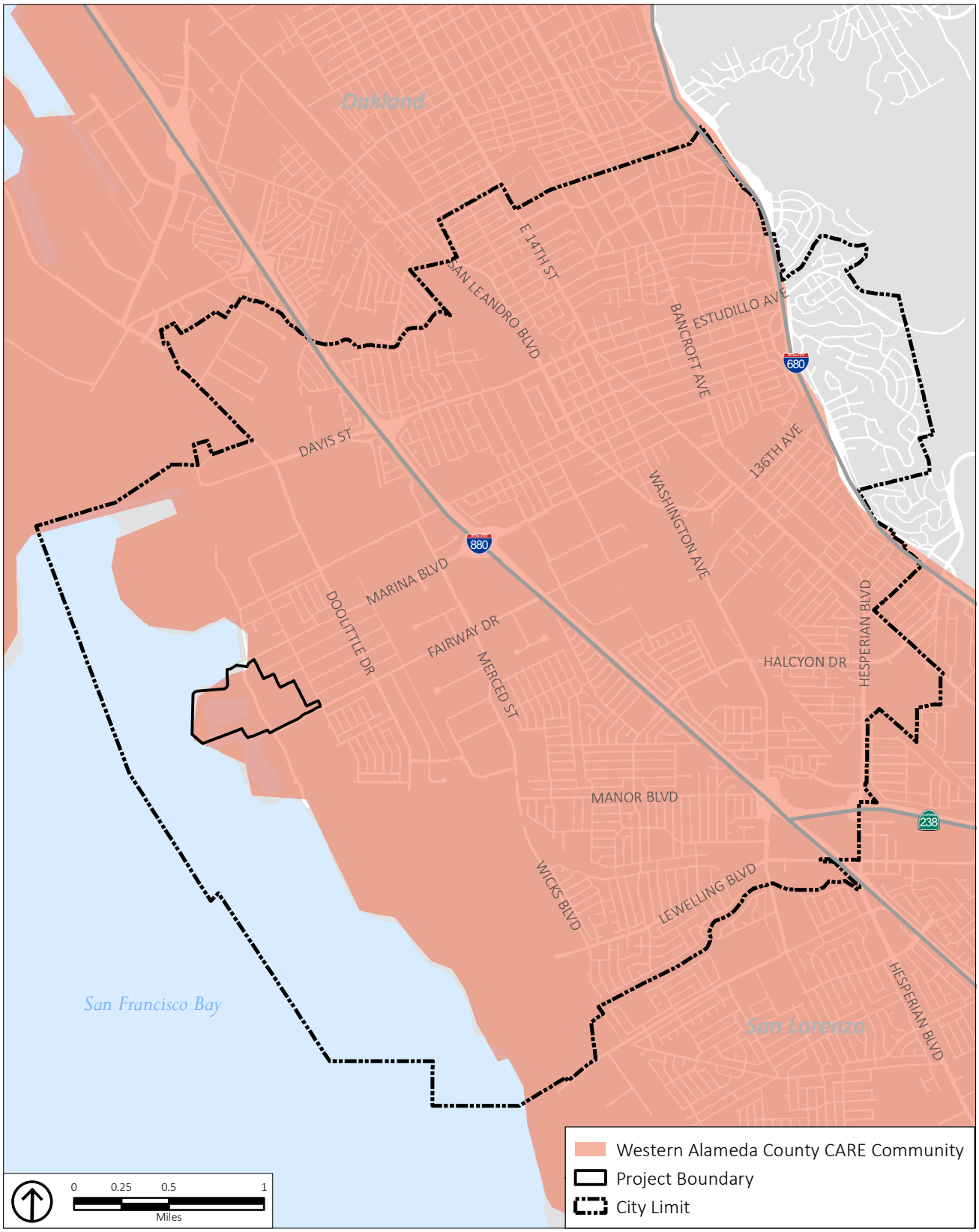
The Alameda County Transportation Commission (Alameda CTC) is the congestion management agency (CMA) for Alameda County. Alameda CTC is tasked with developing a comprehensive transportation improvement program among local jurisdictions that will reduce traffic congestion and improve land use decision-making and air quality. Alameda CTC's latest congestion management program (CMP) is the *2013 Congestion Management Program*. Alameda CTC's countywide transportation model must be consistent with the regional transportation model developed by the Metropolitan Transportation Commission (MTC) with the Association of Bay Area Governments (ABAG) data. The countywide transportation model is used to help evaluate cumulative transportation impacts of local land use decisions on the CMP system. In addition, Alameda CTC's updated CMP includes multi-modal performance measures and trip reduction and transportation demand management (TDM) strategies consistent with the goals of reducing regional Vehicle Miles Travelled (VMT) in accordance with Senate Bill 375 (SB 375). Strategies identified in the 2013 CMP for Alameda County, where local jurisdictions are a responsible agency, include:[24]

- Designated CMP Roadway Network: Identify and update a CMP roadway network to monitor performance in relation to established level of service (LOS) standards.
- Level of Service Standards: Establish LOS standards as a quantitative tool to analyze the effects of land use changes on the transportation network's performance.
- Multi-modal Performance: Use established multi-modal performance measures to evaluate whether the transportation network is achieving the broad mobility goals in the CMP.
- Travel Demand Management: Implement TDM measures to reduce pressure on existing roadway and parking capacity by using incentives and disincentives to influence travel choice.

[22] Bay Area Air Quality Management District (BAAQMD), 2006. Community Air Risk Evaluation Program, Phase I Findings and Policy Recommendations Related to Toxic Air Contaminants in the San Francisco Bay Area.

[23] Bay Area Air Quality Management District (BAAQMD), 2010. Air Toxics NSR Program, Health Risk Screening Analysis Guidelines.

[24] Alameda County Transportation Commission (Alameda CTC), 2013. Congestion Management Program http://www.alamedactc.org/files/managed/Document/12460/2013_Alameda_County_Congestion_Management_Program.pdf, October.



Source: Bay Area Air Quality Management District, 2013; Alameda County, 2013; City of San Leandro, 2014; PlaceWorks, 2014.

Figure 4.2-1
BAAQMD Community Air Risk Evaluation (CARE) Program
Impacted Communities Proximate to San Leandro

- Land Use Analysis Program: Assess the impacts of land use decisions made by local jurisdictions on regional transportation systems and ensure that significant impacts are appropriately mitigated.
- Database and Travel Demand Model: Approve that computer models used for sub-areas are consistent with the CMP model and standardized modeling assumptions.
- Capital Improvement Program: Develop a list of projects intended to maintain or improve the performance of the multimodal transportation system in Alameda County, to move people and goods, and to mitigate regional transportation impacts.
- Program Conformance and Monitoring: Ensure local government conformance with LOS standards, Trip Reduction Program, Land Use Analysis Program, and payment of membership dues. Monitor information provided by the local governments to determine whether the CMP objectives are being met.

Plan Bay Area: Strategy for a Sustainable Region

Plan Bay Area is the Bay Area's Regional Transportation Plan (RTP)/Sustainable Community Strategy (SCS). The Plan Bay Area was adopted jointly by ABAG and MTC July 18, 2013.[25] The SCS lays out a development scenario for the region, which when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement) beyond the per capita reduction targets identified by CARB. According to Plan Bay Area, the Plan meets a 16 percent per capita reduction of GHG emissions by 2035 and a 10 percent per capita reduction by 2020 from 2005 conditions.

As part of the implementing framework for Plan Bay Area, local governments have identified Priority Development Areas (PDAs) to focus growth. PDAs are transit-oriented, infill development opportunity areas within existing communities. Overall, well over two-thirds of all regional growth in the Bay Area by 2040 is allocated within PDAs. PDAs are expected to accommodate 80 percent (or over 525,570 units) of new housing and 66 percent (or 744,230) of new jobs in the region.[26] The Project site is not within a PDA.[27]

4.2.1.4 EXISTING AIR QUALITY

Attainment Status of the SFBAAB

Areas that meet AAQS are classified attainment areas, and areas that do not meet these standards are classified nonattainment areas. Severity classifications for O_3 range from marginal, moderate, and serious to severe and extreme. The attainment status for the Air Basin is shown in Table 4.2-2. The Air Basin is currently designated a nonattainment area for California and National O_3, California and National $PM_{2.5}$, and California PM_{10} AAQS.

[25] It should be noted that the Bay Area Citizens filed a lawsuit on MTC's and ABAG's adoption of *Plan Bay Area*.

[26] Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), 2013. *Plan Bay Area: Strategy for a Sustainable Region,* July 18.

[27] Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), 2013. *Plan Bay Area,* http://geocommons.com/maps/141979.

TABLE 4.2-2 ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE SAN FRANCISCO BAY AREA AIR BASIN

Pollutant	State	Federal
Ozone – 1-hour	Nonattainment (serious)	Nonattainment
Ozone – 8-hour	Nonattainment	Classification revoked (2005)
PM_{10}	Nonattainment	Unclassified/Attainment
$PM_{2.5}$	Nonattainment	Nonattainment[a]
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	Attainment	Unclassified/Attainment
All others	Unclassified/Attainment	Unclassified/Attainment

a. On January 9, 2013, the EPA issued a final rule to determine that the Air Basin has attained the 24-hour $PM_{2.5}$ National AAQS. This action suspends federal State Implementation Plan planning requirements for the Bay Area. The Air Basin will continue to be designated nonattainment for the National 24-hour $PM_{2.5}$ standard until such time as BAAQMD elects to submit a re-designation request and a maintenance plan to EPA and EPA approves the proposed re-designation.
Source: California Air Resources Board, 2014, Area Designations: Activities and Maps, http://www.arb.ca.gov/desig/adm/adm.htm, June 4.

Existing Ambient Air Quality

Existing Air Quality Trends

Existing levels of ambient air quality and historical trends and projections in the vicinity of San Leandro have been documented by measurements made by the BAAQMD. The Oakland Monitoring Station is the closest air quality monitoring station to the City. However, the Oakland Monitoring Station does not monitor PM_{10}; therefore, data from the San Francisco Monitoring Station was used to supplement data for this criteria air pollutant. Data from these monitoring stations are summarized in Table 4.2-3. The federal $PM_{2.5}$ standard has been exceeded several times in the last five years. The State O_3 standard and the State PM_{10} standards have been exceeded only once in the last five years. The State and federal CO and NO_2 and the Federal O_3 standards have not been exceeded in the last five years in the vicinity of the City.

Existing San Leandro Shoreline Development Emissions

The Project site includes a total of approximately 75 acres, consisting of 52 acres of land and a 23-acre public boat harbor. The boat slips are currently only 30 percent occupied (140 occupied boat slips), primarily due to the build-up of silt in the harbor and channel. The small fraction of boats within the harbor may be being used as housing.[28]

[28] The current estimated population within the Project site is between 16 to 20 live-aboard residents, based upon correspondence between Steve Noack (PlaceWorks) and Delmarie Snodgrass, City of San Leandro, September 5, 2014.

TABLE 4.2-3 AMBIENT AIR QUALITY MONITORING SUMMARY

	Number of Days Thresholds Were Exceeded and Maximum Levels During Such Violations				
Pollutant/Standard	2009	2010	2011	2012	2013
Ozone (O_3)[a]					
State 1-Hour ≥ 0.09 ppm	0	1	0	0	0
State 8-hour ≥ 0.07 ppm	0	0	0	0	0
Federal 8-Hour > 0.075 ppm	0	0	0	0	0
Maximum 1-Hour Conc. (ppm)	0.092	0.097	0.091	0.072	0.076
Maximum 8-Hour Conc. (ppm)	0.063	0.058	0.052	0.045	0.064
Carbon Monoxide (CO)[a]					
State 8-Hour > 9.0 ppm	0	0	0	0	*
Federal 8-Hour ≥ 9.0 ppm	0	0	0	0	*
Maximum 8-Hour Conc. (ppm)	1.99	1.63	1.50	1.57	*
Nitrogen Dioxide (NO_2)[a]					
State 1-Hour ≥ 0.18 (ppm)	0	0	0	0	0
Maximum 1-Hour Conc. (ppb)	62.0	64.1	56.5	64.8	60.3
Coarse Particulates (PM_{10})[b]					
State 24-Hour > 50 µg/m^3	0	0	0	1	0
Federal 24-Hour > 150 µg/m^3	0	0	0	0	0
Maximum 24-Hour Conc. (µg/ m^3)	36.0	39.7	45.6	50.6	44.3
Fine Particulates ($PM_{2.5}$)[a]					
Federal 24-Hour > 35 µg/m^3	1	0	3	0	2
Maximum 24-Hour Conc. (µg/m^3)	36.3	25.2	49.3	33.6	37.9

Notes: ppm: parts per million; ppb: parts per billion; µg/m^3: or micrograms per cubic meter; * = insufficient data; NA = Not Available
a. Data from the Oakland 9925 International Boulevard Monitoring Station.
b. Data from the San Francisco Arkansas Street Monitoring Station.
Source: California Air Resources Board, 2014, Air Pollution Data Monitoring Cards (2009, 2010, 2011, 2012,, and 2013), http://www.arb.ca.gov/adam/index.html, accessed July 8, 2014.

Other uses within the Project site include two golf courses, a small branch library, the Spinnaker Yacht Club, the San Leandro Yacht Club, the Marina Harbormaster's office, The Marina Inn on San Francisco Bay, Horatio's restaurant, El Torito restaurant, and several public and private (for berthers) bathroom facilities. Criteria air pollutants generated by existing land uses in the San Leandro Shoreline Development area were modeled with CalEEMod 2013.2.2, based on trip generation provided by Kittelson & Associates, emission rates for boats (pleasure-crafts), and based on fuel sales in the harbor provided by the City.[29] Criteria air pollutant emissions are shown in Table 4.2-4.

[29] Emission rates for boats estimated from *Port of Los Angeles Baseline Air Emissions Inventory* (Starcrest Consulting Group, LLC, 2005).

TABLE 4.2-4 CRITERIA AIR POLLUTANT EMISSIONS GENERATED BY EXISTING LAND USES WITHIN THE SAN LEANDRO SHORELINE DEVELOPMENT

	Criteria Air Pollutants (Average lbs/day)			
Category	ROG	NO_x	PM_{10}	$PM_{2.5}$
Area[a]	22	<1	<1	<1
Energy[a]	<1	1	<1	<1
On-Road Mobile Sources[a]	16	52	19	6
Boats (Pleasure-Crafts)[b]	144	49	9	9
Total	182	102	28	14
Tons Per Year (tpy)	33 tpy	19 tpy	5 tpy	3 tpy

Note: Emissions may not total to 100 percent due to rounding.
a. Source: CalEEMod 2013.2.2. Based on year 2014 emission rates. No trip generation is assumed for the 16-20 live-aboard boat residences.
b. Source: Starcrest, 2005. Port of Los Angeles Baseline Air Emissions Inventory.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases. Residential areas are also considered sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Other sensitive receptors include retirement facilities, hospitals, and schools. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial, commercial, retail, and office areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, since the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the population.

Existing sensitive receptors proximate to the Project site include the on-site recreational facilities (i.e., the Marina Park and golf courses) and the abutting residential homes to the north and east. Additionally, guests of the existing hotel (The Marina Inn) may also be considered sensitive receptors. However, overall exposures to TACs for the visitors to the on-site recreational facilities and guests of the hotel would be relatively low and are considered short-term exposures. Unlike the exposures to TACs for nearby residences, the short-term exposures to TACs for hotel and recreational use sensitive receptors would not result in significant health risks.

Finally, students and staff of Garfield Elementary School, located approximately 1,100 feet northeast of the Project site, are considered sensitive receptors. The school-based receptors are located further from the Project site than the abutting residential homes to the north and east. Additionally, the exposure period for school-based receptors (e.g., 8 hours per day, 5 days per week, and 180-240 days per year) are much lower than for residential receptors (e.g., 24 hours per day, 7 days per week, and 350 days per year). Ultimately, the overall exposures to TACs for the sensitive receptors at Garfield Elementary School would

be much lower compared to TAC exposures for the nearby residences. Therefore, only the on-site and off-site residents were considered sensitive receptors for this evaluation.

4.2.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, the Project would have a significant effect on the environment with respect to air quality if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

4.2.2.1 BAAQMD SIGNIFICANCE CRITERIA

The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics, odors, and greenhouse gas emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of the CEQA Guidelines. In May 2011, the updated BAAQMD CEQA Air Quality Guidelines were amended to include a risk and hazards threshold for new receptors and modified procedures for assessing impacts related to risk and hazard impacts.

On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance in the BAAQMD CEQA Air Quality Guidelines. The court did not determine whether the thresholds of significance were valid on their merits, but found that the adoption of the thresholds was a project under CEQA. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds and cease dissemination of them until the BAAQMD complied with CEQA.

Following the court's order, the BAAQMD released revised CEQA Air Quality Guidelines in May 2012 that include guidance on calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures, and which set aside the significance thresholds. The BAAQMD recognizes that lead agencies may rely on the previously recommended Thresholds of Significance contained in its CEQA Guidelines adopted in 1999. The Alameda County Superior Court, in ordering BAAQMD to set aside the thresholds, did not address the merits of the science or evidence supporting the thresholds. The City finds, therefore, that despite the Superior Court' ruling, and in light of the subsequent case history discussed below, the science and reasoning contained in

the BAAQMD 2011 CEQA Air Quality Guidelines provide the latest state-of-the-art guidance available. For that reason, substantial evidence supports continued use of the BAAQMD 2011 CEQA Air Quality Guidelines.

On August 13, 2013, the First District Court of Appeal reversed the trial court judgment and upheld the BAAQMD's CEQA Guidelines. In addition to the City's independent determination that use of the BAAQMD's CEQA Guidelines is supported by substantial evidence, they have been found to be valid guidelines for use in the CEQA environmental review process. On November 26, 2013, the California Supreme Court granted review on the issue of whether CEQA requires analysis of how existing environmental conditions affect a project (*California Building Industry Association v Bay Area Air Quality Management District*, Case No. A135335 and A136212).

While the outcome of this case presents uncertainty for current project applicants and local agencies regarding proper evaluation of toxic air contaminants in CEQA documents, local agencies still have a duty to evaluate impacts related to air quality and greenhouse gas emissions. In addition, CEQA grants local agencies broad discretion to develop their own thresholds of significance, or to rely on thresholds previously adopted or recommended by other public agencies or experts so long as they are supported by substantial evidence. Accordingly, the City of San Leandro is using the BAAQMD's 2011 thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality and community risk and hazards.

Criteria Air Pollutant Emissions and Precursors

Regional Significance Criteria

The BAAQMD's criteria for regional significance for projects that exceed the screening thresholds are shown in Table 4.2-5. Criteria for both the construction and operational phases of the Project are shown.

TABLE 4.2-5 BAAQMD REGIONAL (MASS EMISSIONS) CRITERIA AIR POLLUTANT SIGNIFICANCE THRESHOLDS

	Construction Phase	Operational Phase	
Pollutant	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual 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
PM_{10} and $PM_{2.5}$ Fugitive Dust	Best Management Practices	None	None

Source: Bay Area Air Quality Management District (BAAQMD), 2010 (Revised 2011). Appendix D: Threshold of Significance Justification, in California Environmental Quality Act Air Quality Guidelines.

Local CO Hotspots

Congested intersections have the potential to create elevated concentrations of CO, referred to as CO hotspots. The significance criteria for CO hotspots are based on the California AAQS for CO, which is 9.0 ppm (8-hour average) and 20.0 ppm (1-hour average). However, with the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology, the SFBAAB is in attainment of the California and National AAQS, and CO concentrations in the SFBAAB have steadily declined. Because CO concentrations have improved, the BAAQMD does not require a CO hotspot analysis if the following criteria are met:

- The Project is consistent with an applicable congestion management program established by the County Congestion Management Agency for designated roads or highways, the regional transportation plan, and local congestion management agency plans.
- The Project 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 intersection 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).[30]

Community Risk and Hazards

The BAAQMD's significance thresholds for local community risk and hazard impacts apply to both the siting of a new source and to the siting of a new receptor. Local community risk and hazard impacts are associated with TACs and $PM_{2.5}$ because emissions of these pollutants can have significant health impacts at the local level. For assessing community risk and hazards, sources within a 1,000-foot radius are considered. Sources are defined as freeways, high volume roadways (with volume of 10,000 vehicles or more per day or 1,000 trucks per day), and permitted sources.[31]

- The Project would generate TACs and $PM_{2.5}$ during construction activities that could elevate concentrations of air pollutants at the surrounding residential receptors.[32] The thresholds for construction-related local community risk and hazard impacts are the same as for Project operations. The BAAQMD has adopted screening tables for air toxics evaluation during construction.[33] Construction-related TAC and $PM_{2.5}$ impacts should be addressed on a case-by-case basis, taking into consideration the specific construction-related characteristics of each project and proximity to off-site receptors, as applicable.[34]

[30] Bay Area Air Quality Management District, 2011 (revised), California Environmental Quality Act Air Quality Guidelines.

[31] Bay Area Air Quality Management District, 2011 (revised), California Environmental Quality Act Air Quality Guidelines.

[32] Students and staff of Garfield Elementary School are located further from the Project site than the abutting residential homes to the north and east. Additionally, the exposure period for school-based receptors (e.g., 8 hours per day, 5 days per week, and 180-240 days per year) are much lower than for residential receptors (e.g., 24 hours per day, 7 days per week, and 350 days per year). Ultimately, the overall exposures to TACs for the sensitive receptors at Garfield Elementary School would be much lower compared to TAC exposures for the nearby residences. Therefore, only the on-site and off-site residents were considered sensitive receptors for this evaluation.

[33] Bay Area Air Quality Management District, 2010, Screening Tables for Air Toxics Evaluations during Construction.

[34] Bay Area Air Quality Management District, 2011 (revised), California Environmental Quality Act Air Quality Guidelines.

- The Project involves construction of new residential units and new commercial and recreational facilities, and is therefore not a major source of operational TACs and stationary $PM_{2.5}$. BAAQMD thresholds related to siting new sources of TACs and $PM_{2.5}$ near existing or planned sensitive receptors is not applicable.
- The Project is a sensitive land use that would warrant an on-site community risk and hazards evaluation. Therefore, the community risk and hazards thresholds for operation of the Project are applicable.

The thresholds identified below are applied to the Project's operational phase (siting new receptors) and construction emissions:

Community Risk and Hazards – Project

Project-level emissions of TACs or $PM_{2.5}$ from individual sources within 1,000 feet of the Project that exceed any of the thresholds listed below are considered a potentially significant community health risk:

- Non-compliance with a qualified Community Risk Reduction Plan;
- An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 would be a significant cumulatively considerable contribution;
- An incremental increase of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$ from a single source would be a significant cumulatively considerable contribution.[35]

Community Risk and Hazards – Cumulative

Cumulative sources represent the combined total risk values of each of the individual sources within the 1,000-foot evaluation zone. A project would have a cumulative considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius from the fence line of a source or location of a receptor, plus the contribution from the Project, exceeds the following:

- Non-compliance with a qualified Community Risk Reduction Plan; or
- An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0; or
- 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.[36]

Odors

The BAAQMD's thresholds for odors are qualitative. The BAAQMD does not consider odors generated from use of construction equipment and activities to be objectionable. For operational phase odor impacts, a project that would result in the siting of a new source of odor or exposure of a new receptor to existing or planned odor sources should consider odor impacts. The BAAQMD considers potential odor impacts to be significant if there are five confirmed complaints per year from a facility, averaged over three years. The BAAQMD has established odor screening thresholds for land uses that have the potential

[35] Bay Area Air Quality Management District, 2011 (revised), California Environmental Quality Act Air Quality Guidelines.
[36] Bay Area Air Quality Management District, 2011 (revised), California Environmental Quality Act Air Quality Guidelines.

to generate substantial odor complaints, including wastewater treatment plants, landfills or transfer stations, composting facilities, confined animal facilities, food manufacturing, and chemical plants.[37]

4.2.3 IMPACT DISCUSSION

Methodology

Criteria air pollutants emissions from construction and operation of the Project were calculated using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2. Transportation emissions are based on trip generation provided by Kittelson & Associates. Construction emissions are based on the tentative construction schedule provided by the project developer. A Health Risk Assessment (HRA) for construction activities was conducted for the Project using Lakes Environmental ISCST3. A HRA for operational activities was conducted using BAAQMD's screening analysis tools.

This section discusses the air quality impacts of the Project. This discussion is organized by and responds to each of the potential impacts identified in the thresholds of significance.

AIR-1 Implementation of the Project would not conflict with or obstruct implementation of the applicable air quality plan.

Large projects that exceed regional employment, population, and housing planning projections have the potential to be inconsistent with the regional inventory compiled as part of BAAQMD's Bay Area 2010 Clean Air Plan. The Project would generate an increase in 586 people and 927 employees within the Project site and would affect regional vehicle miles traveled (VMT).[38] As described in Chapter 4.11, *Population and Housing*, the Project would not exceed the level of population or housing foreseen in City or regional planning efforts; and therefore, would not have the potential to substantially affect housing, employment, and population projections within the region, which is the basis of the Bay Area 2010 Clean Air Plan projections. Additionally, the net increase in regional emissions generated by the Project would not exceed the BAAQMD's emissions thresholds (see AIR-3). These thresholds are established to identify projects that have the potential to generate a substantial amount of criteria air pollutants. Because the Project would not exceed these thresholds, the Project would not be considered by the BAAQMD to be a substantial emitter of criteria air pollutants. Therefore, the Project would not conflict with or obstruct implementation of the Bay Area 2010 Climate Action Plan and impacts would be considered *less than significant*.

Applicable Regulations:

- AB 1493: Pavley Fuel Efficiency Standards
- Title 20 California Code of Regulations (CCR): Appliance Energy Efficiency Standards
- Title 24, Part 6, CCR: Building and Energy Efficiency Standards

[37] Bay Area Air Quality Management District, 2011 (revised), California Environmental Quality Act Air Quality Guidelines.

[38] Existing residences include an estimated 16-20 people living in houseboats on the Marina (Chapter 4.11, *Population and Housing*). There are an estimated 76 existing employees. For the proposed Project, there are a projected 970 residents and 1,003 employees.

- Title 24, Part 11, CCR: Green Building Standards Code
- CARB Rule 2485 (13 CCR Chapter 10, Section 2485), Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
- CARB Rule 2480 (13 CCR Chapter 10, Section 2480), Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- CARB Rule 2477 (13 CCR Section 2477 and Article 8), Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate
- BAAQMD, Regulation 2, Rule 2, New Source Review
- BAAQMD, Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants
- BAAQMD Regulation 6, Rule 1, General Requirements
- BAAQMD Regulation 6, Rule 2, Commercial Cooking Equipment
- BAAQMD Regulation 7, Odorous Substances
- BAAQMD Regulation 8, Rule 3, Architectural Coatings
- BAAQMD Regulation 8, Rule 4, General Solvent and Surface Coatings Operations
- BAAQMD Regulation 8, Rule 7, Gasoline Dispensing Facilities
- BAAQMD Regulation 11, Rule 2, Asbestos, Demolition, Renovation and Manufacturing

Significance Before Mitigation: Less than significant.

AIR-2	During construction, the Project could violate an air quality standard or contribute substantially to an existing or projected air quality violation.

BAAQMD has identified thresholds of significance for criteria pollutant emissions and criteria air pollutant precursors including, ROG, NOx, PM_{10} and $PM_{2.5}$. Development projects below the significance thresholds are not expected to generate sufficient criteria pollutant emissions to violate any air quality standards or contribute substantially to an existing or projected air quality violation.

Construction Emissions

Construction activities produce combustion emissions from various sources, such as on-site heavy-duty construction vehicles, vehicles hauling materials to and from the site, and motor vehicles transporting the construction crew. Site preparation activities produce fugitive dust emissions (PM_{10} and $PM_{2.5}$) from demolition and soil-disturbing activities, such as grading and excavation. Air pollutant emissions from construction activities on-site would vary daily as construction activity levels change.

The Project would result in overlapping construction sub-phases and substantial demolition export that would occur proximate to existing sensitive land uses to the north and east of the Project site. Therefore, a quantified analysis of the Project's construction emissions was conducted using CalEEMod based on information available.

Construction Exhaust Emissions

Construction emissions are based on the preliminary construction schedule developed for the Project. The Project site would be developed in up to three construction phases; however, the balance of the office uses may be developed in Phase 2. Because condensing the Project construction activities into two development phases would generate higher average daily construction emissions, air quality modeling is conservatively based on a two-phased development. The first phase would include redevelopment along the shoreline on the western portion of the site and the library on Fairway Drive. The second phase encompasses the inland residential development within the Marina Golf Course and the balance of the office land uses within the office park. The Spinnaker Yacht Club may remain on-site and be repurposed or replaced as the proposed Aquatic Center. The Project would be developed based on the market demand for the proposed non-residential and residential Project components. Phase 1 could commence as early as 2016 and is estimated to take approximately three and one-half years to complete. Phase 2 would commence following completion of Phase 1 and could commence as early as 2020 and is estimated to take approximately one and a half years to complete. Buildout of the Project is forecast to occur as early as 2021.[39]

To determine potential construction-related air quality impacts, criteria air pollutants generated by Project-related construction activities are compared to the BAAQMD significance thresholds in Table 4.2-5 for average daily emissions. Average daily emissions are based on the annual construction emissions divided by the total number of active construction days. As shown in Table 4.2-6, criteria air pollutant emissions from construction equipment exhaust would not exceed the BAAQMD average daily thresholds. Consequently, construction-related criteria pollutant emissions from exhaust are *less than significant*.

Fugitive Dust

As identified above, the Project would warrant substantial asphalt and some minor building demolition. In addition, ground-disturbing activities would generate fugitive dust. Fugitive dust emissions (PM_{10} and $PM_{2.5}$) are considered to be significant unless the Project implements the BAAQMD's Best Management Practices (BMPs) for fugitive dust control during construction. PM_{10} is typically the most significant source of air pollution from the dust generated from construction. The amount of dust generated during construction would be highly variable and is dependent on the amount of material being demolished, the type of material, moisture content, and meteorological conditions. If uncontrolled, PM_{10} and $PM_{2.5}$ levels downwind of actively disturbed areas could possibly exceed State standards. Consequently, construction-related criteria pollutant emissions are potentially *significant*.

Impact AIR-2: During construction of the Project, construction activities would generate fugitive dust during ground-disturbing activities that exceeds the BAAQMD significance thresholds.

[39] To be conservative, air quality modeling was completed using an earlier start date of January 1, 2016, which reflects higher emission rates from off-road equipment and on-road vehicles. Vehicle and equipment turnover, as well as changes in emissions regulations, result in lower emission rates in later years.

TABLE 4.2-6 SAN LEANDRO SHORELINE DEVELOPMENT CONSTRUCTION-RELATED CRITERIA AIR POLLUTANT EMISSIONS ESTIMATES

	Criteria Air Pollutants (tons/year)[a]					
Year	ROG	NO_x	Fugitive PM_{10}[b]	Exhaust PM_{10}	Fugitive $PM_{2.5}$[b]	Exhaust $PM_{2.5}$
Phase 1						
2016	1	8	1	<1	<1	<1
2017	1	7	1	<1	<1	<1
2018	1	6	1	<1	<1	<1
2019	2	3	1	<1	<1	<1
Phase 2						
2019	<1	2	<1	<1	<1	<1
2020	3	3	<1	<1	<1	<1
Total Construction Emissions	8	30	4	1	1	1
	Criteria Air Pollutants (average lbs/day)[a]					
	ROG	NO_x	Fugitive PM_{10}[b]	Exhaust PM_{10}	Fugitive $PM_{2.5}$[b]	Exhaust $PM_{2.5}$
Average Daily Construction Emissions all Phases[c]	13	48	6	2	2	2
BAAQMD Average Daily Project-Level Threshold	54	54	BMPs	82	BMPs	54
Exceeds Average Daily Threshold	**No**	**No**	**NA**	**No**	**NA**	**No**

Note: Emissions may not total to 100 percent due to rounding.
BMP: Best Management Practices; NA: not applicable
a. Construction phasing is based on the preliminary information provided by the developer. Where specific information regarding Project-related construction activities was not available, construction assumptions were based on CalEEMod defaults, which are based on construction surveys conducted by South Coast Air Quality Management District of construction equipment and phasing for comparable projects. Modeling is conservative because it assumes an earlier start date which reflects slightly higher emission rates from off-road equipment and on-road vehicles. Vehicle/equipment turnover as well as changes in emissions regulations result in lower emissions rates in later years.
b. Includes implementation of best management practices for fugitive dust control required by BAAQMD as mitigation, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, and daily street sweeping.
c. Average daily emissions are based on the construction emissions divided by the total number of active construction days. Phase 1 and Phase 2 construction activities would not overlap. The total number of construction days is estimated to be 1,255.
Source: CalEEMod 2013.2.2.

Mitigation Measure AIR-2: Applicants for new development projects within the Shoreline Development shall require their construction contractor(s) to comply with the following BAAQMD Best Management Practices for reducing construction emissions of PM_{10} and $PM_{2.5}$:

- Water all active construction areas at least twice daily or as often as needed to control dust emissions. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever possible.
- Pave, apply water twice daily or as often as necessary to control dust, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer).
- Sweep daily (with water sweepers using reclaimed water if possible) or as often as needed all paved access roads (e.g., Monarch Bay Drive and Fairway Drive), parking areas and staging areas at the construction site to control dust.
- Sweep public streets daily (with water sweepers using reclaimed water if possible) in the vicinity of the Project site, or as often as needed, to keep streets free of visible soil material.
- Hydro-seed or apply non-toxic soil stabilizers to inactive construction areas.
- Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit vehicle traffic speeds on unpaved roads to 15 mph.
- Replant vegetation in disturbed areas as quickly as possible.
- Install sandbags or other erosion control measures to prevent silt runoff from public roadways.

The City of San Leandro Building Official or their designee shall verify compliance that these measures have been implemented during normal construction site inspections.

Significance After Mitigation: Less than significant. Mitigation Measure AIR-2 would require adherence to the current BAAQMD's basic control measures for reducing construction emissions of PM and would ensure impacts from fugitive dust generated during construction activities are less than significant.

AIR-3 During operation, the Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Long-term air pollutant emissions generated by a mixed-use development are typically associated with the burning of fossil fuels in cars (mobile sources); energy use for cooling, heating, and cooking (energy); and landscape equipment (area sources). The primary source of long-term criteria air pollutant emissions generated by the Project would be emissions produced from Project-generated vehicle trips. The Project would generate a total of 9,046 average daily trips during a weekday and 8,171 average daily trips on the weekend, which is a net increase of 6,525 additional average daily trips during a weekday and 5,764 additional average daily trips on the weekend compared to existing conditions. Table 4.2-7 identifies the net increase in criteria air pollutant emissions associated with the Project.

As shown in Table 4.2-7, the net increase in operational emissions generated by the Project would not exceed the BAAQMD daily or annual thresholds. Consequently, the Project would not cumulatively contribute to the nonattainment designations of the Air Basin, and regional operational phase air quality impacts would be *less than significant*.

TABLE 4.2-7 SAN LEANDRO SHORELINE DEVELOPMENT CRITERIA AIR POLLUTANTS EMISSIONS FORECAST

	Criteria Air Pollutants (average lbs/day)			
Category	ROG	NO_x	PM_{10}	$PM_{2.5}$
Existing				
Area[a]	22	<1	<1	<1
Energy[a]	<1	1	<1	<1
On-Road Mobile Sources[a]	10	30	19	5
Boats (Pleasure-Crafts)[b]	144	49	9	9
Total	**176**	**80**	**28**	**14**
Project				
Area[a]	48	<1	<1	<1
Energy[a]	<1	4	<1	<1
On-Road Mobile Sources[a]	27	82	52	15
Total	**75**	**86**	**52**	**15**
Change from 2014 Land Uses	-101	7	25	1
BAAQMD Average Daily Project-Level Threshold	54	54	82	54
Exceeds Average Daily Threshold	**No**	**No**	**No**	**No**

	Criteria Air Pollutants (tons/year)			
Category	ROG	NO_x	PM_{10}	$PM_{2.5}$
Existing Tons per Year (tpy)	32	15	5	3
Project Tons per Year (tpy)	14	16	10	3
Change from 2014 Land Uses	-18	1	5	<1
BAAQMD Annual Project-Level Threshold	10 tpy	10 tpy	15 tpy	10 tpy
Exceeds Annual Threshold	**No**	**No**	**No**	**No**

[a] CalEEMod 2013.2. Based on year 2020 emission rates No trip generation is assumed for the 16-20 live-aboard boat residences.
[b] Starcrest, 2005. *Port of Los Angeles Baseline Air Emissions Inventory*
Note: Emissions may not total to 100 percent due to rounding. New buildings would be constructed to the 2013 Building & Energy Efficiency Standards (effective July 1, 2014). Assumes all fireplaces are gas-burning fireplaces in accordance with BAAQMD Regulation 6, Rule 3.
New buildings would be constructed to the 2013 Building & Energy Efficiency Standards (effective July 1, 2014). Average daily emissions are based on the annual operational emissions divided by 365 days.
Source: CalEEMod 2013.2. Based on year 2020 emission rates.

Applicable Regulations:

- AB 1493: Pavley Fuel Efficiency Standards
- Title 20 CCR: Appliance Energy Efficiency Standards
- Title 24, Part 6, CCR: Building and Energy Efficiency Standards
- Title 24, Part 11, CCR: Green Building Standards Code
- CARB Rule 2485 (13 CCR Chapter 10, Section 2485), Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

- CARB Rule 2480 (13 CCR Chapter 10, Section 2480), Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- CARB Rule 2477 (13 CCR Section 2477 and Article 8), Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate
- BAAQMD, Regulation 2, Rule 2, New Source Review
- BAAQMD, Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants
- BAAQMD Regulation 6, Rule 1, General Requirements
- BAAQMD Regulation 6, Rule 2, Commercial Cooking Equipment
- BAAQMD Regulation 7, Odorous Substances
- BAAQMD Regulation 8, Rule 3, Architectural Coatings
- BAAQMD Regulation 8, Rule 4, General Solvent and Surface Coatings Operations
- BAAQMD Regulation 8, Rule 7, Gasoline Dispensing Facilities
- BAAQMD Regulation 11, Rule 2, Asbestos, Demolition, Renovation and Manufacturing

Significance Before Mitigation: Less than significant.

AIR-4	**Implementation of the Project would result in a cumulatively considerable net increase of criteria pollutants for which the Project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).**

This section analyzes potential impacts related to air quality that could occur from a combination of the Project with other past, present, and reasonably foreseeable projects within the Air Basin. Any project that produces a significant project-level regional air quality impact in an area that is in nonattainment adds to the cumulative impact. Due to the extent of the area potentially impacted from cumulative project emissions (the Air Basin), a project is cumulatively significant when project-related emissions exceed the BAAQMD emissions thresholds shown in Table 4.2-5. As described in this report, the Project would have a significant construction impact (see AIR-2), and on-site and off-site community risks and hazards (see AIR-5).

Therefore, the Project's contribution to cumulative air quality impacts would be *significant*.

Impact AIR-4: Construction and operation of the Project would cumulatively contribute to the non-attainment designations of the SFBAAB.

Mitigation Measure AIR-4: Implementation of Mitigation Measures AIR-2 and AIR-5 would reduce cumulative air quality impacts.

Significance After Mitigation: Less than significant. Mitigation Measures AIR-2 would reduce impacts from fugitive dust generated during construction activities. Mitigation Measure AIR-5 would reduce exposures of sensitive receptors to substantial concentrations of TACs and PM2.5. With these mitigation measures, regional and localized construction emissions would not exceed the BAAQMD significance thresholds. Consequently, the Project would not cumulatively contribute to the

nonattainment designations of the Air Basin and impacts would be less than significant with mitigation.

AIR-5 Construction of the Project could expose sensitive receptors to substantial concentrations of air pollution.

On-Site and Off-Site Community Risk and Hazards During Construction

The Project would elevate concentrations of TACs and $PM_{2.5}$ in the vicinity of sensitive land uses during construction activities. Construction activities could occur proximate to sensitive receptors both on-site and off-site. Additional sensitive receptors would be the on-site residents living in the North Residential Apartments or the South Mixed-Use Condos/Apartments during the second phase of construction. Consequently, a full health risk assessment (HRA) of TACs and $PM_{2.5}$ is warranted.

Sources evaluated in the HRA include off-road construction equipment and heavy-duty diesel trucks along the truck route. The US EPA ISCST3 dispersion modeling program was used to estimate excess lifetime cancer risks and acute and chronic non-cancer hazard indexes at the nearest sensitive receptors. Results of the analysis are shown in Table 4.2-8.

TABLE 4.2-8 CONSTRUCTION RISK SUMMARY

	Project Level Risk			
Receptor	Cancer Risk – Adult (per million)	Cancer Risk – Child (per million)	Chronic Hazards	$PM_{2.5}$
Off-Site Resident	8.3	44	0.22	0.68
On-Site Resident[a]	2.6	14	0.07	0.22
Threshold	10	10	1.0	0.3 µg/m^3
Exceeds Threshold	**No**	**Yes**	**No**	**Yes**

a. On-site residents (living in the North Residential Apartments or the South Mixed-Use Condos/Apartments) would only be exposed to construction emissions during the second phase of construction. Off-site residents would be exposed to construction emissions for all construction phases.
Source: Lakes AERMOD View, 8.7, 2014.

The results of the HRA are based on the maximum receptor concentration over a 5-year construction exposure period for off-site receptors and 1.5-year construction period for on-site receptors, assuming 24-hour outdoor exposure, and averaged over a 70-year lifetime. The results of the HRA indicate that the incremental cancer risk for off-site residents proximate to the site during the construction period is 8.3 per million for the adult-scenario, which would not exceed the cancer risk threshold; and 44 per million for the child scenario, which would exceed the cancer risk threshold. The results of the HRA indicate that the incremental cancer risk for on-site residents proximate to the site during the second phase of construction is 2.6 per million for the adult-scenario, which would not exceed the threshold; and 14 per million for the child scenario, which would exceed the cancer risk threshold. For non-carcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both off-site and on-site residents. Therefore, chronic non-carcinogenic hazards are within acceptable limits. In addition, $PM_{2.5}$ annual concentrations would exceed the BAAQMD significance thresholds for off-site residents.

Consequently, the Project would expose sensitive receptors to substantial concentrations of air pollutant emissions during construction, and impacts would be *significant*.

Impact AIR-5: Construction activities of the Project could expose sensitive receptors to substantial concentrations of TAC and $PM_{2.5}$.

Mitigation Measure AIR-5: The construction contractor shall use equipment that meets the United States Environmental Protection Agency (EPA)-Certified Tier 3 emissions standards for off-road diesel-powered construction equipment greater than 50 horsepower. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine, as defined by CARB regulations. Prior to construction, the project engineer shall ensure that all demolition and grading plans clearly show the requirement for EPA Tier 3 or higher emissions standards and Level 3 diesel emissions control for construction equipment over 50 horsepower. During construction, the construction contractor shall maintain a list of all operating equipment in use on the Project Site for verification by the City of San Leandro Building Official or their designee. The construction equipment list shall state the makes, models, and numbers of construction equipment on-site. Equipment shall properly service and maintain construction equipment in accordance with the manufacturer's recommendations. Construction contractors shall also ensure that all nonessential idling of construction equipment is restricted to five minutes or less in compliance with California Air Resources Board's Rule 2449.

Significance After Mitigation: Less than significant. Mitigation Measures AIR-5 would reduce the Project's localized construction emissions. The mitigated health risk values were calculated and are summarized in Table 4.2-9. The results indicate that with mitigation, the excess cancer risk for the adult and child exposure scenarios would be less than the threshold values. Additionally, the $PM_{2.5}$ annual concentrations would be below the significance threshold with mitigation. Consequently, the Project would not expose sensitive receptors to substantial concentrations of air pollutant emissions during construction and impacts would be less than significant with mitigation.

TABLE 4.2-9 CONSTRUCTION RISK SUMMARY WITH MITIGATION

	Project Level Risk			
Receptor	Cancer Risk – Adult (per million)	Cancer Risk – Child (per million)	Chronic Hazards	$PM_{2.5}$
Off-Site Resident	1.4	7.9	0.05	0.24
On-Site Resident[a]	0.3	1.6	0.01	0.08
Threshold	10	10	1.0	0.3 $\mu g/m^3$
Exceeds Threshold	**No**	**No**	**No**	**No**

a. On-site residents (living in the North Residential Apartments or the South Mixed-Use Condos/Apartments) would only be exposed to construction emissions during the second phase of construction. Off-site residents would be exposed to construction emissions for all construction phases.
Source: Lakes AERMOD View, 8.7, 2014.

AIR-6 Operation of the Project would not expose sensitive receptors to substantial concentrations of air pollution.

CO Hotspots

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the State one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9.0 ppm. Because CO is produced in the greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds.

The Project would generate 1,040 new external trips during the weekday morning peak hour, 1,060 new external trips during the weekday evening peak hour, and 860 new external trips during the Saturday midday hour.[40] The Project would not conflict with Alameda CTC's CMP because it would not hinder the capital improvements outlined in the CMP or alter regional travel patterns. Alameda CTC's CMP must be consistent with MTC's/ABAG's Plan Bay Area, and an overarching goal of the regional plan is to concentrate development in areas where there are existing services and infrastructure rather than allocate new growth in outlying areas where substantial transportation investments would be necessary to achieve the per capita passenger vehicle VMT and associated GHG emissions reductions. The Project would be consistent with the overall goals of the MTC/ABAG's Plan Bay Area. Furthermore, the Project would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour or to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited. Trips associated with the Project would not exceed the screening criteria of the BAAQMD. Localized air quality impacts related to mobile-source emissions would therefore be *less than significant*.

Toxic Air Contaminants – Siting of Sensitive Receptors

On-site health risks and hazards imposed by existing sources (e.g., stationary sources and traffic on adjacent streets and freeways) on the sensitive receptors of the Project (i.e., residents) were evaluated pursuant to BAAQMD's methodology. BAAQMD has developed screening thresholds for assessing potential health risks from stationary and mobile sources. Sources located within 1,000 feet of the Project are included in BAAQMD's screening thresholds. To evaluate nearby sources, BAAQMD's database of existing sources and freeway and surface streets screening tables for Alameda County were used.

Stationary sources near the Project site were identified using BAAQMD's Stationary Source Screening Analysis Tool.[41] Two stationary sources were identified (County of Alameda Public Works emergency gasoline generator and San Leandro Marina gasoline dispensing). However, the gas dispensing operation is located at the San Leandro Marina and will be removed as part of the Project. Therefore, there will be no emissions from this source in the future and it does not require additional evaluation.

[40] Kittelson & Associates, 2014, Traffic Impact Analysis for the San Leandro Shoreline Development Project.

[41] BAAQMD Stationary Source Screening Analysis Tool can be accessed from BAAQMD's website at http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx

There were no roadways identified within 1,000 feet of the Project site with over 10,000 average daily traffic trips.[42] The closest high volume roadway, Marina Boulevard, has a traffic volume larger than 10,000 vehicles per day east of Aurora Drive. West of Aurora Drive, the traffic volumes are less than 10,000 vehicles per day. Additionally, the Transportation Impact Analysis for the Project indicates that the twenty-four hour vehicle counts for the portion of Marina Boulevard west of Aurora Drive would be less than 10,000 vehicles.[43] Because the traffic volumes are less than 10,000 vehicles per day west of Aurora Drive and the intersection of Marina Boulevard and Aurora Drive is located more than 1,000 feet from the Project site, emissions of vehicles on Marina Boulevard do not require additional evaluation.

Lastly, the Oakland International Airport (Airport) is located approximately 1 mile northwest of the Project site. Although the Airport is located over 1,000 feet away from the Project site, air emissions from aircraft, ground service equipment (GSE), auxiliary power units, and fuel storage and handling have the potential to impact areas over 1,000 feet away. The results of a Health Risk Assessment conducted for the Oakland Airport in 2003 indicated that the incremental cancer risk to off-site residents and children in the Project site area was less than 10 in one million (i.e., BAAQMD's significance threshold) and therefore, no adverse health impacts are expected.[44] In addition, a mitigation measure requiring conversion of all diesel GSE at the Airport, which accounted for 60 percent of the cancer risk, to alternative fuels by 2010 results in lower incremental cancer risks than previously predicted. Based on these results, air emissions from the Airport were not evaluated further.

BAAQMD provides screening tables that indicate predicted community risk impacts for roadways.[45] The results of the on-site community risk summary are provided in Table 4.2-10.

TABLE 4.2-10 ON-SITE COMMUNITY RISK SUMMARY

	Project Level Risk		
Emission Source	Cancer Risk (per million)	Chronic Hazards	$PM_{2.5}$
County of Alameda Public Works	0	0.0	0.0
Threshold	10	1.0	0.3 $\mu g/m^3$
Exceeds Threshold	**No**	**No**	**No**

The results of the cancer risk screening analysis for all stationary and mobile sources within 1,000 feet of the Project are less than the BAAQMD threshold of 10 in a million for a lifetime cancer risk and the non-carcinogenic chronic hazard index of 1.0. In addition, $PM_{2.5}$ concentrations are below the BAAQMD significance threshold of 0.3 $\mu g/m^3$. Therefore, the results of this screening level risk assessment, with

[42] California Environmental Health Tracking Program (CEHTP), 2007. Traffic linkage tool can be accessed at http://www.ehib.org/traffic_tool.jsp

[43] Kittelson & Associates, 2014, Traffic Impact Analysis for the San Leandro Shoreline Development Project.

[44] Port of Oakland, 2003. *Draft Ambient Air Quality Human Health Risk Assessment for the Oakland International Airport*. Prepared for the Port of Oakland by CDM.

[45] BAAQMD Roadway Analysis Tables can be accessed from BAAQMD's website at http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx

respect to on-site risk during the operational phase of the Project, indicate that the impact would be *less than significant*.

Three new restaurants are proposed as part of the Project. One or more of these restaurants could have char broilers, which produce VOCs and PM_{10} emissions. However, the char broilers would be subject to permitting by BAAQMD under Rule 2, *Commercial Cooking Equipment*, and would be required to install control devices in order to reduce emissions. All commercial cooking operations that are subject to the rule must also register their char broiler and control equipment with the BAAQMD and pay applicable fees. With implementation of these requirements, emissions from the char broilers would be *less than significant* and would not pose a health risk to Project occupants.

Applicable Regulations:

- CARB Rule 2485 (13 CCR Chapter 10, Section 2485), Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
- CARB Rule 2480 (13 CCR Chapter 10, Section 2480), Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- CARB Rule 2477 (13 CCR Section 2477 and Article 8), Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate
- BAAQMD, Regulation 2, Rule 2, New Source Review
- BAAQMD, Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants
- BAAQMD Regulation 6, Rule 1, General Requirements
- BAAQMD Regulation 6, Rule 2, Commercial Cooking Equipment
- BAAQMD Regulation 7, Odorous Substances
- BAAQMD Regulation 8, Rule 3, Architectural Coatings
- BAAQMD Regulation 8, Rule 4, General Solvent and Surface Coatings Operations
- BAAQMD Regulation 8, Rule 7, Gasoline Dispensing Facilities
- BAAQMD Regulation 11, Rule 2, Asbestos, Demolition, Renovation and Manufacturing

Significance Before Mitigation: Less than significant.

AIR-7 Implementation of the Project would not create or expose a substantial number of people to objectionable odors.

The Project would construct new residential, commercial, office, conference center, and restaurant land uses within the Project site. Construction and operation of these types of projects (residential, commercial, office, civic, restaurant) would not generate substantial odors or be subject to odors that would affect a substantial number of people. The type of facilities that are considered to have objectionable odors include wastewater treatments plants, compost facilities, landfills, solid waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food manufacturing facilities. Residential, commercial, office, restaurant, recreational, and civic (library) uses are not associated with foul odors that constitute a public nuisance.

During operation, residential units and the restaurants could generate odors from cooking. Odors from cooking are not substantial enough to be considered nuisance odors that would affect a substantial number of people. Furthermore, nuisance odors are regulated under BAAQMD Regulation 7, Odorous Substances, which requires abatement of any nuisance generating an odor complaint. BAAQMD's Regulation 7, Odorous Substances, places general limitations on odorous substances and specific emission limitations on certain odorous compounds. [46] In addition, odors are also regulated under BAAQMD Regulation 1, Rule 1-301, Public Nuisance, which states that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property."

During construction activities, construction equipment exhaust and application of asphalt and architectural coatings would temporarily generate odors. Any construction-related odor emissions would be temporary and intermittent. Additionally, noxious odors would be confined to the immediate vicinity of the construction equipment. By the time such emissions reach any sensitive receptor sites, they would be diluted to well below any level of air quality concern. Impacts would be *less than significant*.

Therefore, because existing sources of odors are required to comply with BAAQMD Regulation 7, impacts to siting of new sensitive land uses would be *less then significant*.

Applicable Regulations:

- California Health & Safety Code, Section 114149
- BAAQMD Regulation 1, Rule 1-301, Public Nuisance
- BAAQMD Regulation 7, Odorous Substances

Significance Before Mitigation: Less than significant.

4.2.4 CUMULATIVE IMPACT DISCUSSION

AIR-8 Implementation of the Project would cumulatively contribute to air quality impacts in the San Francisco Bay Area Air Basin.

As described under AIR-4, regional air quality impacts were identified as significant; therefore, in combination with past, present, and reasonably foreseeable projects, the Project would result in a significant cumulative impact with respect to air quality. Therefore, the impact would be *significant*.

[46] It should be noted that while restaurants can generate odors, these sources are not identified by BAAQMD as nuisance odors since they typically do not generate significant odors that affect a substantial number of people. Larger restaurants that employ five or more people are subject to BAAQMD Regulation 7, Odorous Substances.

Impact AIR-8: Construction and operation of the Project would cumulatively contribute to the non-attainment designations of the SFBAAB.

Mitigation Measure AIR-8: Implementation of Mitigation Measures AIR-2 and AIR-5 would reduce cumulative air quality impacts.

Significance After Mitigation: Less than significant. Mitigation Measures AIR-2 would reduce impacts from fugitive dust generated during construction activities. Mitigation Measure AIR-5 would reduce exposures of sensitive receptors to substantial concentrations of TACs and PM2.5. With these mitigation measures, regional and localized construction emissions would not exceed the BAAQMD significance thresholds. Consequently, the Project would not cumulatively contribute to the nonattainment designations of the Air Basin and impacts would be less than significant with mitigation.

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