C. AIR QUALITY

This section describes the air quality issues and provides an overview of existing air quality conditions in and around the vicinity of the Larkspur SMART Station Area Plan (Plan) area and the San Francisco Bay Area. The section summarizes the ambient air quality standards and the regulatory framework related to air quality. Project-related air quality impacts are then analyzed, and mitigation measures are recommended, if necessary, to reduce potentially significant air quality impacts.

1. Setting

The following discussion provides an overview of existing air quality conditions in and around the San Francisco Bay and the Plan area. Ambient air quality standards and the regulatory framework related to air quality are summarized. Climate, air quality conditions, and typical air pollutant types and sources are described.

a. Background. Air quality standards, the regulatory framework, and State and federal attainment status are discussed below.

(1) Ambient Air Quality Standards. Pursuant to the federal Clean Air Act (CAA) of 1970, the U.S. Environmental Protection Agency (EPA) established national ambient air quality standards (NAAQS). The NAAQS were established for major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Both the EPA and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). 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 public with a reasonable margin of safety. These ambient air quality standards are levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each criteria pollutant.

Federal standards include both primary and secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.[1]

Health effects of criteria pollutants and their potential sources are described below and summarized in Table IV.C-1. The standards would have to be exceeded by a large margin, or for a prolonged period of time, for the health effects to occur. Table IV.C-2 shows both the State and federal standards for these criteria pollutants; the California Ambient Air Quality Standards (CAAQS) are more stringent than the NAAQS.

[1] U.S. Environmental Protection Agency, 2012. Website: www.epa.gov/air/criteria.html. May.

Table IV.C-1: Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust • Natural events, such as decomposition of organic matter	• Reduced tolerance for exercise • Impairment of mental function • Impairment of fetal development • Death at high levels of exposure • Aggravation of some heart diseases (angina)
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust • High temperature stationary combustion • Atmospheric reactions	• Aggravation of respiratory illness • Reduced visibility • Reduced plant growth • Formation of acid rain
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight	• Aggravation of respiratory and cardiovascular diseases • Irritation of eyes • Impairment of cardiopulmonary function • Plant leaf injury
Lead (Pb)	• Contaminated soil	• Impairment of blood functions and nerve construction • Behavioral and hearing problems in children
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Stationary combustion of solid fuel • Construction activities • Industrial processes • Atmospheric chemical reactions	• Reduced lung function • Aggravation of the effects of gaseous pollutants • Aggravation of respiratory and cardiorespiratory diseases • Increased cough and chest discomfort • Soiling • Reduced visibility
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels • Smelting of sulfur-bearing metal ores • Industrial processes	• Aggravation of respiratory diseases (asthma, emphysema) • Reduced lung function • Irritation of eyes • Reduced visibility • Plant injury • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board (ARB), 2012.

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

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

Nitrogen Dioxide. NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contribute to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection. On January 22, 2010, the EPA strengthened the health-based NAAQS for NO_2.

Sulfur Dioxide. Sulfur dioxide (SO_2) is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Particulate Matter. Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns, or PM_{10}. $PM_{2.5}$ refers to fine suspended particulate matter with an aerodynamic diameter of 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion, through abrasion, such as tire or brake lining wear, or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces, and can enter the human body through the lungs.

Table IV.C-2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	–		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	–	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	
Nitrogen Dioxide (NO_2)[h]	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Gas Phase Chemi-luminescence	0.053 ppb (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1-Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3)	–	
Lead (Pb)[j,k]	30-day average	1.5 µg/m^3	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m^3 (for certain areas)[k]	Same as Primary Standard	
	Rolling 3-month average[i]	–		0.15 µg/m^3		
Sulfur Dioxide (SO_2)[i]	24-Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	0.14 ppm (for certain areas)[i]	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3-Hour	–		–	0.5 ppm (1300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3)	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[i]	–	
Visibility-Reducing Particles[l]	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[j]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Table notes included on next page.

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

[g] Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

[h] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb are identical to 0.100 ppm.

[i] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standards to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[j] The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[l] In 1989, the ARB converted both the general Statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the Statewide and Lake Tahoe Air Basin standards, respectively.

°C = degrees Celsius
ARB = California Air Resources Board
U.S. EPA = United States Environmental Protection Agency
$\mu g/m^3$ = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
ppm = parts per million
ppb = parts per billion

Source: ARB, June 7, 2012.

Lead. Lead 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 manufactures.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the EPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of 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

Toxic Air Contaminants. In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the EPA and the CARB. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants.

High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as having posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers or schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

b. Regulatory Framework. The Bay Area Air Quality Management District (BAAQMD) is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. The District's jurisdiction encompasses seven counties—Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara and Napa—and portions of Solano and Sonoma counties. The CARB and EPA regulate direct emissions from motor vehicles.

(1) Federal Air Quality Regulations. At the federal level, the EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required EPA to establish primary and secondary NAAQS and required each state to prepare an air quality control plan referred to as a State Implement Plan (SIP). The Federal Clean Air Act Amendments of 1990 (FCAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformity with the mandates of the FCAAA and determine if implementation will achieve air quality goals. If the EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area which imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may

result in the application of sanctions on transportation funding and stationary air pollution sources in the air basin.

The 1970 FCAA authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The FCAA Amendments of 1990 changed deadlines for attaining NAAQS as well as the remedial actions required of areas of the nation that exceed the standards. Under the FCAA, State and local agencies in areas that exceed the NAAQS are required to develop SIPs to show how they will achieve the NAAQS by specific dates. The FCAA requires that projects receiving federal funds demonstrate conformity to the approved SIP and local air quality attainment plan for the region. Conformity with the SIP requirements would satisfy the FCAA requirements.

(2) State Air Quality Regulations. The CARB is the agency responsible for the coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires that all air districts in the State achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CCAA specifies that districts should focus on reducing the emissions from transportation and air-wide emission sources, and provides districts with the authority to regulate indirect sources.

CARB is also responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. CARB is primarily responsible for Statewide pollution sources and produces a major part of the SIP. Local air districts provide additional strategies for sources under their jurisdiction. CARB combines this data and submits the completed SIP to the EPA.

Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which in many cases are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

(3) Bay Area Air Quality Management District. The BAAQMD seeks to attain and maintain air quality conditions in the San Francisco Bay Area Air Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. The clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law.

Clean Air Plan*.* The BAAQMD is responsible for developing a Clean Air Plan which guides the region's air quality planning efforts to attain the CAAQS. The BAAQMD's 2010 Clean Air Plan is the latest Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_x), particulate matter and greenhouse gas emissions.

The Bay Area 2010 Clean Air Plan, which was adopted on September 15, 2010 by the BAAQMD's board of directors:

- Updates the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;

- Provides a control strategy to reduce ozone, particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan;
- Reviews progress in improving air quality in recent years; and
- Establishes emission control measures to be adopted or implemented in the 2010 to 2012 timeframe.

BAAQMD CARE Program. The Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources, area sources and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area. The BAAQMD has identified six communities as impacted: Concord, Richmond/San Pablo, Western Alameda County, San Jose, Redwood City/East Palo Alto and Eastern San Francisco. The City of Larkspur has not been included as an impacted community, and no other communities within Marin County have been identified as in need of immediate emission reduction measures.

BAAQMD CEQA Air Quality Guidelines. The BAAQMD *CEQA Air Quality Guidelines*[2] 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 including thresholds of significance, mitigation measures and background air quality information. They also include 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 their *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 modify 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 2011 BAAQMD *CEQA Air Quality Guidelines*. 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. In view of the court's order, the BAAQMD is no longer recommending that the thresholds of significance be used as a generally applicable measure of a project's significant air quality impacts. On May 4, 2012, BAAQMD commenced an appeal in the First District of the California Court of Appeal seeking to overturn the Alameda County Superior Court decision. In August 2013, the First District Court of Appeal overturned the trial court and held that the thresholds of significance were not subject to CEQA

[2] Bay Area Air Quality Management District, 2011. *CEQA Air Quality Guidelines*. May.

review. The BAAQMD has not reinstated the 2011 Guidelines; however, 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 that, despite the court ruling, 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*

(4) Attainment Status Designations. The CARB is required to designate areas of the State as attainment, nonattainment or unclassified for all State standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data does not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The EPA designates areas for O_3, CO, and NO_2 as either "does not meet the primary standards," or "cannot be classified" or "better than national standards." For SO_2, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified" or "better than national standards."

Table IV.C-3 provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

Table IV.C-3: San Francisco Bay Area Attainment Status

Pollutant	Averaging Time	California Standards [a]		National Standards [b]	
		Concentration	Attainment Status	Concentration[c]	Attainment Status
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment [f]
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Mean	0.030 ppm (57 mg/m^3)	Attainment	0.053 ppm (100 µg/m^3)	Attainment
	1-Hour	0.18 ppm (338 µg/m^3)	Attainment	0.100 ppm [j]	Unclassified
Ozone (O_3)	8-Hour	0.07 ppm (137 µg/m^3)	Nonattainment [h]	0.075 ppm	Nonattainment [d]
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	Not Applicable	Not Applicable [e]
Suspended Particulate Matter (PM_{10})	Annual Mean	20 µg/m^3	Nonattainment [g]	Not Applicable	Not Applicable
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Suspended Particulate Matter ($PM_{2.5}$)	Annual Mean	12 µg/m^3	Nonattainment[g]	15 µg/m^3	Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m^3 See footnote [i]	Nonattainment
Sulfur Dioxide (SO_2) [k]	Annual Mean	Not Applicable	Not Applicable	80 µg/m^3 (0.03 ppm)	Attainment
	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	365 µg/m^3 (0.14 ppm)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	Attainment

Table notes included on next page.

[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the State standard.

[b] National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 $\mu g/m^3$. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 $\mu g/m^3$.
Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

[c] National air quality standards are set by EPA at levels determined to be protective of public health with an adequate margin of safety.

[d] On September 22, 2011, the EPA announced it will implement the current 8-hour ozone standard of 75 ppb. The EPA expects to finalize initial area designations for the 2008 8-hour ozone standard by mid-2012.

[e] The national 1-hour ozone standard was revoked by EPA on June 15, 2005.

[f] In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

[g] In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

[h] The 8-hour CA ozone standard was approved by the CARB on April 28, 2005 and became effective on May 17, 2006.

[i] EPA lowered the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006. EPA designated the Bay Area as nonattainment of the $PM_{2.5}$ standard on October 8, 2009. The effective date of the designation is December 14, 2009, and the Air District has three years to develop a SIP that demonstrates the Bay Area will achieve the revised standard by December 14, 2014. The SIP for the new $PM_{2.5}$ standard must be submitted to the EPA by December 14, 2012.

[j] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010).

[k] On June 2, 2010, the EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO_2 NAAQS however must continue to be used until one year following EPA initial designations of the new 1-hour SO_2 NAAQS. EPA expects to designate areas by June 2012.

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.
ppm = parts per million
mg/m^3 = milligrams per cubic meter
$\mu g/m^3$ = micrograms per cubic meter

Source: Bay Area Air Quality Management District, 2012.

c. Existing Climate and Air Quality. Regional air quality, local climate, air quality, and air pollution climatology within the Marin County region is described below.

The City of Larkspur is located in the San Francisco Bay Area, a large shallow air basin ringed by hills that taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist. One is through the strait known as the Golden Gate, a direct outlet to the Pacific Ocean. The second extends to the northeast, along the west delta region of the Sacramento and San Joaquin Rivers.

The City of Larkspur is within the jurisdiction of the BAAQMD. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants, and the number of days during which the region exceeds air quality standards, have fallen dramatically. Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Ozone levels, measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially in the San Francisco Bay Area as a result of aggressive programs by the BAAQMD and other regional, State and federal agencies. The reduction of peak concentrations represents progress in improving public health; however, the Bay Area still exceeds the State standard for 1-hour ozone.

Levels of PM_{10} have exceeded State standards two of the last three years, and the area is considered a nonattainment area for this pollutant relative to the State standards. The Bay Area is an unclassified area for the federal PM_{10} standard.

No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The Bay Area is currently considered a maintenance area for State and federal CO standards.

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Climate and topography are major influences on air quality in the project area. Marin County benefits from constant winds, a marine layer of fog which lifts in the morning hours during the summer, and heavy winter precipitation compared to other parts of the Bay Area. Wind direction is east-west, in alignment with the ridges (Corte Madera Ridge and Southern Heights Ridge in Larkspur). The combination of wind direction and topography allows for constant scouring of the ambient air, resulting in good air quality most of the time. It also means that air pollution generated in Marin County is dispersed to other parts of the Bay Area.

The CARB monitors air pollution at various sites within California. The closest monitoring site to the Plan area in Marin County is located in the City of San Rafael. Pollutant monitoring results for the years 2009 to 2012 at the San Rafael ambient air quality monitoring station, shown in Table IV.C-4, indicate that air quality in the Plan area has generally been good. There were six exceedances of the State PM_{10} standard recorded in 2010 and 2011 and no exceedances of the federal PM_{10} standard during the four-year recording period. There were four exceedances recorded in 2010 and one exceedance recorded in 2011 of the federal $PM_{2.5}$ standard. Additionally, there was an exceedance of the State annual arithmetic standard for $PM_{2.5}$ in 2009. The State 1-hour ozone standard was not exceeded during the four-year period at this monitoring station. State and federal 8-hour ozone standards were also not exceeded during the four-year period at this monitoring station. In addition, CO, SO_2, and NO_2 standards were not exceeded in this area during the four-year period.

Table IV.C-4: Ambient Air Quality at the San Rafael Monitoring Station

Pollutant	Standard	2009	2010	2011	2012[a]
Carbon Monoxide (CO)					
Maximum 1-hour concentration (ppm)		2.2	1.7	1.9	2.3
Number of days exceeded:	State: > 20 ppm	0	0	0	0
	Federal: > 35 ppm	0	0	0	0
Maximum 8-hour concentration (ppm)		1.24	1.13	1.21	1.1
Number of days exceeded:	State: > 9 ppm	0	0	0	0
	Federal: > 9 ppm	0	0	0	0
Ozone (O_3)					
Maximum 1-hour concentration (ppm)		0.075	0.083	0.092	0.076
Number of days exceeded:	State: > 0.09 ppm	0	0	0	0
Maximum 8-hour concentration (ppm)		0.059	0.070	0.070	0.057
Number of days exceeded:	State: > 0.07 ppm	0	0	0	0
	Federal: > 0.08 ppm	0	0	0	0
Coarse Particulates (PM_{10})					
Maximum 24-hour concentration ($\mu g/m^3$)		38.4	51.3	54.1	36.0
Number of days exceeded:	State: > 50 $\mu g/m^3$	0	6	6	0
	Federal: > 150 $\mu g/m^3$	0	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		16.2	16.7	16.5	ND
Exceeded for the year:	State: > 20 $\mu g/m^3$	No	No	No	ND
	Federal: > 50 $\mu g/m^3$	No	No	No	ND
Fine Particulates ($PM_{2.5}$)					
Maximum 24-hour concentration ($\mu g/m^3$)		34.2	46.5	42.2	26.5
Number of days exceeded:	Federal: > 35 $\mu g/m^3$	0	4	1	0
Annual arithmetic average concentration ($\mu g/m^3$)		12.8	10.7	9.8	8.0
Exceeded for the year:	State: > 12 $\mu g/m^3$	Yes	No	No	No
	Federal: > 15 $\mu g/m^3$	No	No	No	No
Nitrogen Dioxide (NO_2)					
Maximum 1 hour concentration (ppm)		0.052	0.057	0.053	0.052
Number of days exceeded:	State: > 0.25 ppm	0	0	0	0
Annual arithmetic average concentration (ppm)		0.012	0.012	0.012	ND
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No	ND
Sulfur Dioxide (SO_2)[a]					
Maximum 1-hour concentration (ppm)		24	11	19	68
Number of days exceeded:	State: > 0.25 ppm	0	0	0	0
Maximum 3-hour concentration (ppm)		ND	ND	ND	ND
Number of days exceeded:	Federal: > 0.5 ppm	ND	ND	ND	ND
Maximum 24-hour concentration (ppm)		0.005	0.004	0.003	0.008
Number of days exceeded:	State: > 0.04 ppm	0	0	0	0
	Federal: > 0.14 ppm	0	0	0	0
Annual arithmetic average concentration (ppm)		0.000	0.000	0.001	ND
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No	ND

[a] Oakland-21st Street was the closest monitoring station for results.
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
ND = No data. There was insufficient (or no) data to determine the value.

Source: CARB and EPA, 2013.

d. Larkspur General Plan Policies. The Health and Safety Chapter[3] of the City of Larkspur's 1990 General Plan includes the following goals, policies, and programs related to Air Quality:

Health and Safety Element

Goal 10: Ensure that air pollution levels do not threaten public health and safety.

- Policy r: Seek to comply with State and federal standards for air quality.
- Policy s: Seek to reduce auto travel and, thereby, the pollutants from auto emissions.
- Policy t: Ensure that traffic generated from new development is not the cause of State and federal air quality standards being exceeded in Marin County.
    - Action Program [37]: Require new development to mitigate impacts if the project causes a change in the level of air pollutants by a specified amount.

2. Impacts and Mitigation Measures

This section provides an assessment of the potential adverse impacts related to air quality within the City of Larkspur. It begins with the criteria of significance, which establishes the thresholds for determining whether an impact is significant. The latter part of this section identifies potential impacts associated with implementation of the Station Area Plan. Where potentially significant impacts are identified, mitigation measures are recommended.

a. Criteria of Significance. Implementation of the Station Area Plan would have a significant effect on the environment if it would:

- Conflict with or obstruct implementation of the current Air Quality Plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors or the general public to substantial pollutant concentrations as defined by federal or State air quality standards; or
- Create objectionable odors affecting a substantial number of people.

b. Impacts Analysis. The following section provides an evaluation and analysis for the potential impacts associated with implementation of the Station Area Plan for each of the criteria of significance listed above.

(1) Conflict With Current Air Quality Plan. The applicable air quality plan is the Bay Area 2010 Clean Air Plan, which was adopted on September 15, 2010. The Clean Air Plan is a comprehensive plan to improve Bay Area air quality and protect public health. The Clean Air Plan

[3] Larkspur, City of, 1990. *Larkspur General Plan*.

defines a control strategy to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduce greenhouse gas emissions to protect the climate. Consistency with the Clean Air Plan can be determined if the project does the following: 1) supports the goals of the Clean Air Plan; 2) includes applicable control measures from the Clean Air Plan; and 3) would not disrupt or hinder implementation of any control measures from the Clean Air Plan. The project's consistency with these objectives is described below.

1) Does the project support the goals of the Clean Air Plan?

The primary goals of the Bay Area 2010 Clean Air Plan are to: attain air quality standards; reduce population exposure to air pollutants and protect public health in the Bay Area; and reduce greenhouse gas emissions and protect the climate.

The Station Area Plan would promote transit oriented development, promote alternative modes of transportation and would generally support the goals of the Clean Air Plan by supporting a reduction in Vehicle Miles Traveled (VMT) within the Bay Area.

2) Does the project include applicable control measures from the Clean Air Plan?

The control strategies of the Bay Area 2010 Clean Air Plan include stationary source measures, mobile source measures, and transportation control measures. This latest Clean Air Plan also identifies land use and local impact measures and energy and climate measures. Stationary source measures are not specifically applicable to the Station Area Plan and, therefore, are not evaluated further in this EIR. The project's consistency with other measures in the Bay Area 2010 Clean Air Plan is discussed below.

Transportation and Mobile Source Control Measures. The transportation control measures in the Bay Area 2010 Clean Air Plan are designed to reduce emissions from motor vehicles by reducing vehicle trips and VMT in addition to reducing vehicle idling and traffic congestion. The measures also support alternate modes of transportation.

The Urban Design Guidelines[4] for the Station Area Plan provide guidelines for new development focusing on improving pedestrian and bicycle circulation throughout the Plan area to reduce vehicle miles traveled. The guidelines state that new development should maximize public access, via pedestrian-scaled streets and pathways, to provide multiple routes for walking to services, the SMART train, or Ferry Terminal sites. They also state that, where possible, parking should be located away from the street frontage so that retail or other uses will line the pedestrian way for a more pedestrian-friendly environment. In addition, proximity of parcels in the Plan area to transit, bike routes, pathways, and trails, and to a wide range of uses and activities, make this area particularly suitable to walking and bicycling. Therefore, in general, development associated with implementation of the Station Area Plan would include the applicable transportation demand and control measures from the BAAQMD's Clean Air Plan.

[4] Larkspur, City of, 2014. *Larkspur SMART Station Area Plan, Public Review Draft*. February.

Land Use and Local Impact Measures. The Bay Area 2010 Clean Air Plan includes Land Use and Local Impacts Measures (LUMs) to achieve the following: promote mixed-use, compact development to reduce motor vehicle travel and emissions; and ensure that planned growth is focused in a way that protects people from exposure to air pollution associated with stationary and mobile sources of emissions. The LUMs identified by the BAAQMD are not specifically applicable to the Station Area Plan as they primarily relate to actions the BAAQMD will take to reduce impacts from goods movement and health risks in affected communities. The measures also detail new regulatory actions the BAAQMD will undertake related to land use, including the updated *CEQA Air Quality Guidelines*, and indirect source review, which is still under development by the BAAQMD. One of the purposes of the Station Area Plan is to promote mixed-use, compact development so as to reduce vehicle miles traveled. The Urban Design Guidelines for the Station Area Plan encourage new development in the Plan area to complement Larkspur's existing mix of retail, office, and residential uses. The Guidelines promote transit-oriented development and dense, more compact growth patterns with a mix of uses in the Plan area. Therefore, implementation of the Station Area Plan would not conflict with any of the Land Use and Local Impact Measures of the Bay Area 2010 Clean Air Plan.

Energy Measures. The Bay Area 2010 Clean Air Plan also includes Energy and Climate Control Measures (ECM), which are designed to reduce ambient concentrations of criteria pollutants and reduce emissions of CO_2. Implementation of these measures is intended to promote energy conservation and efficiency in buildings throughout the community, promote renewable forms of energy production, reduce the "urban heat island" effect by increasing reflectivity of roofs and parking lots, and promote the planting of (low-VOC-emitting) trees to reduce biogenic emissions, lower air temperatures, provide shade, and absorb air pollutants. The energy measures are not specifically applicable to the Station Area Plan at this time as they relate to future building codes and other actions that regulatory agencies may adopt; however, the Station Area Plan would meet the requirements for specific energy and climate control measures as they are adopted by the BAAQMD and the City of Larkspur in the future. Further, included in the Urban Design Guidelines for the Station Plan Area is the City of Larkspur's commitment to incorporating sustainability into its operations and practices. The Guidelines include a measure requiring the provision of trees and landscaped areas along pedestrian walkways, in parking lots, and in public spaces. The Station Area Plan also specifies installation of low maintenance, non-invasive plantings. The Station Area Plan also recommends utilizing recycled and recyclable materials, and prioritizing pedestrians and cyclists in streetscape treatments.

3) Would the project disrupt or hinder implementation of any control measures from the Clean Air Plan?

As discussed above, implementation of the Station Area Plan would not conflict with the measures outlined in the Clean Air Plan, including transportation control measures and energy measures. The project would not disrupt or hinder implementation of any control measures from the Clean Air Plan.

(2) Violate Any Air Quality Standards. According to the BAAQMD CEQA Air Quality Guidelines, to meet air quality standards for operational-related criteria air pollutant and air precursor impacts, the project must not:

- Contribute to CO concentrations exceeding the State ambient air quality standards;
- Generate construction emissions of ROG, NO_x or $PM_{2.5}$ (exhaust) greater than 54 pounds per day or PM_{10} exhaust emissions greater than 82 pounds per day; or

- Generate operation emissions of ROG, NO_x or $PM_{2.5}$ greater than 10 tons per year or 54 pounds per day or PM_{10} emissions greater than 15 tons per year or 82 pounds per day.

The following section describes the project's CO impacts and construction- and operation-related air quality impacts.

Localized CO Impacts. The BAAQMD has established a screening methodology that provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to the BAAQMD's CEQA Air Quality Guidelines, a proposed project would result in a less-than-significant impact to localized CO concentrations if the following screening 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, and the regional transportation plan and local congestion management agency plans.
- Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- The project would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, or below-grade roadway).

The Station Area Plan is consistent with the Congestion Management Program for Marin County and would not conflict with the Transportation Authority of Marin's Congestion Management Program[5] for designated roads or highways, a regional transportation plan, or other agency plans.

Implementation of the Station Area Plan would not be located in an area where vertical or horizontal mixing is substantially limited (as the area is exposed to breezes from San Francisco Bay) and traffic volumes on roadways in the vicinity of the Plan area are less than 44,000 vehicles per hour. As shown in Table IV.C-4, background CO concentrations in the area are substantially below State and federal standards. Implementation of the Station Area Plan would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour and would not result in localized CO concentrations that exceed State or federal standards. Localized CO impacts would therefore be less-than-significant.

Construction Period Impacts. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROG, directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and TACs such as diesel exhaust particulate matter.

<u>Impact AIR-1</u>: Construction of development associated with implementation of the Station Area Plan could generate air pollutant emissions that could violate air quality standards. (S)

[5] Transportation Authority of Marin, 2011. *Congestion Management Program.* November.

Construction projects associated with implementation of the Station Area Plan could involve demolition of existing structures, site preparation, cut-and-fill activities, grading, and building activities. Construction-related effects on air quality would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils on the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, and to a lesser extent CO, SO_2, NO_x, and VOCs. Sources of fugitive dust would include disturbed soils at the construction sites and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, the silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. These emissions would be temporary and limited to the immediate area surrounding the construction sites.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The BAAQMD has established standard measures for reducing fugitive dust emissions ($PM_{2.5}$ and PM_{10}). With the implementation of standard construction measures such as frequent watering (e.g., two times per day at a minimum), fugitive dust emissions from construction activities would not result in adverse air quality impacts.

Implementation of the Station Area Plan would occur over a 15- to 20-year period. Construction emissions were estimated for the project using the California Emissions Estimator Model (CalEEMod v.1.1). Total construction emissions were estimated using default assumptions in CalEEMod. Total estimated emissions were averaged over a 15-year construction period to estimate the average daily emission rate. Construction-related emissions are presented in Table IV.C-5. As shown in Table IV.C-5, construction emissions of ozone precursors (ROG and NO_x) would not exceed the BAAQMD's threshold for average daily construction emissions.

Table IV.C-5: Project Construction Emissions in Pounds Per Day

Project Construction	ROG	NO_x	Exhaust $PM_{2.5}$	Fugitive Dust $PM_{2.5}$	Total $PM_{2.5}$	Exhaust PM_{10}	Fugitive Dust PM_{10}	Total PM_{10}
Maximum Daily Emissions	16.58	25.56	1.19	0.37	1.55	1.23	0.85	2.08
BAAQMD Thresholds	54.00	54.00	54.00	BMP	NA	82.00	BMP	NA
Exceed Threshold?	**No**	**No**	**No**	**BMP**	**NA**	**No**	**BMP**	**NA**

NA = Not Applicable, the BAAQMD does not have threshold.
BMP = Best Management Practices

Source: LSA Associates, 2013.

The BAAQMD recommends the implementation of Best Management Practices to reduce fugitive dust emissions from construction activities to a less-than-significant level. Implementation of Mitigation Measure AIR-1 would require implementation of the BAAQMD's Best Management Practices and additional measures to reduce diesel PM exhaust emissions and other fugitive dust impacts. Implementation of this mitigation measure would reduce PM emissions to a less-than-significant level.

Mitigation Measure AIR-1: Consistent with guidance from the BAAQMD, the City shall ensure that the following language is included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
- Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the telephone number and person to contact at the City of Larkspur regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

The above measures would reduce construction-period air pollutant emissions to a less-than-significant level. (LTS)

Operational Emissions – Regional Emissions Analysis. Implementation of the Station Area Plan would generate long-term air emissions associated with changes in the permanent use of the Plan area. These long-term emissions are primarily mobile source emissions that would result from vehicle trips associated with Station Area Plan development. Area sources, such as natural gas heaters, landscape equipment, and use of consumer products such as pressurized air canisters would also result in pollutant emissions.

The emissions estimator model CalEEMod, which the BAAQMD approves for use in estimating emissions associated with land use development projects, was used to calculate long-term mobile and area source emissions.

Long-term air emission impacts are those associated with area sources and mobile sources involving any change related to implementation of the Station Area Plan. The project would generate two types of emissions: short-term construction emissions and long-term air emissions, such as those associated with changes in permanent use of the Plan area. These long-term emissions are primarily mobile source emissions that would result from vehicle trips associated with Station Area Plan development. The proposed project is expected to generate approximately 8,214 trips per day (see Section IV.B, Transportation and Circulation). Area sources, such as natural gas heaters, landscape equipment, and use of consumer products, would also result in pollutant emissions. The daily emissions associated with project operational trip generation and area sources are identified in Table IV.C-6 for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Table IV.C-6: Project Regional Emissions

Emissions in Pounds Per Day [a]				
	Reactive Organic Gases	**Nitrogen Oxides**	**PM_{10}**	**$PM_{2.5}$**
Area Source Emissions	864.67	25.15	263.51	263.51
Energy Emissions	1.23	10.83	0.85	0.85
Mobile Source Emissions	18.10	29.12	54.69	2.47
Total Emissions	883.94	65.10	319.05	266.83
BAAQMD Significance Threshold	**54.0**	**54.0**	**82.0**	**54.0**
Exceed?	**Yes**	**Yes**	**Yes**	**Yes**
Emissions in Tons Per Year				
Area Source Emissions	35.42	0.47	4.26	4.26
Energy Emissions	0.22	1.98	0.15	0.15
Mobile Source Emissions	2.69	4.60	7.05	0.40
Total Emissions	38.33	7.05	11.46	4.81
BAAQMD Significance Threshold	**10.00**	**10.00**	**15.00**	**10.00**
Exceed?	**Yes**	**No**	**No**	**No**

[a] Summary reported for winter emissions.

Source: LSA Associates, Inc., 2013.

The ROG emissions from mobile sources include emissions from different automobile operating modes, including running emissions and evaporation from engine running and resting. These emissions also include those resulting from increased emission rates (due to incomplete combustion) that occur when a cold car is started. NO_x emissions comprise running exhaust and are increased during the initial engine running periods.

PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM_{10} occurs when vehicle tires pulverize small rocks and pavement and the vehicle wakes generate airborne dust. The contribution of tire and brake wear is small compared to the other PM emission processes. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles. Since much of the project traffic fleet would be made up of light-duty gasoline-powered vehicles, a majority of the PM_{10} emissions would result from entrainment of roadway dust from vehicle travel.

Area source emissions associated with the project would include emissions from wood-burning devices, water heating and the use of landscaping equipment.

The primary emissions associated with the project are regional in nature, meaning that air pollutants are rapidly dispersed on emission or, in the case of vehicle emissions associated with the project, emissions are released in other areas of the air basin. Because the resulting emissions are dispersed rapidly and contribute only a small fraction of the region's air pollution, air quality in the immediate vicinity of the Plan area would not substantially change compared to existing conditions or the air quality monitoring data reported in Table IV.C-4.

The primary source of area emissions associated with the project is residential wood burning, while mobile source emissions would be generated by vehicles traveling to and from the Plan area.

The results shown in Table IV.C-6 indicate the project would exceed all the criteria pollutant emission thresholds for daily emissions and the annual ROG emission threshold; therefore, the proposed project could have a significant effect on regional air quality and mitigation would be required.

Impact AIR-2: Implementation of the Station Area Plan could generate air pollutant emissions that would exceed the BAAQMD criteria and could substantially contribute to a violation of air quality standards. (S)

When mitigating emissions from land use projects, the BAAQMD recommends incorporating transportation demand management measures to reduce mobile source emissions. One of the key principles to guide future development is to support TOD densities and multi-modal circulation to support transit ridership; this could, in turn, reduce regional VMT. Transportation modeling completed for the project indicates that average daily traffic would be reduced by 19 percent over typical trip generation rates. The Station Area Plan also incorporates recommended measures for reducing emissions including: mix of land uses, transit service, and bike and pedestrian infrastructure. Plan level land use measures that reduce vehicle miles traveled have been implemented to the extent feasible. The Plan incorporates all of the plan level transportation emission reduction measures recommended by the BAAQMD such as the mix of uses, locating residential uses near transit, and prioritizing alternate modes of transportation.

However, implementation of the Station Area Plan does not restrict the use of wood-burning fireplaces in new residential units, and as shown in Table IV.C-6, the project would generate significant area source emissions which primarily result from wood-burning. The City of Larkspur Municipal Code[6] regulates wood-burning appliances by requiring all wood-burning devices be EPA Phase II-Certified. However, implementation of the following measure would further reduce criteria pollutant emissions. However, ROG emissions would remain significant and unavoidable.

> Mitigation Measure AIR-2: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:
>
> - All wood-burning devices, such as woodstoves and open hearth fire places, shall be prohibited in all residential units. Only natural gas fireplaces shall be permitted.

With implementation of this mitigation measure, NO_x, PM_{10} and $PM_{2.5}$ emissions would be reduced to a less-than-significant level; ROG emissions would remain significant and unavoidable. Therefore, even with the prohibition of all wood burning in residential units, ROG emissions would exceed the BAAQMD's significance criterion, and this impact would remain significant and unavoidable. (SU)

[6] Larkspur, City of. City of Larkspur Municipal Code, Section 1, Section 15.52 Installation of Wood Burning Appliances and Removal of Noncertified Wood Burning Appliances.

(3) Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant. According to the BAAQMD, regional air pollution is largely a cumulative impact. No single project is sufficient in size to independently create regional nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. Therefore, if daily average or annual emissions of construction- or operational-related criteria air pollutants exceed any applicable threshold established by the BAAQMD, the proposed project would result in a cumulatively significant impact.

Table IV.C-7: Project Mitigated Emissions

Emissions in Pounds Per Day [a]				
	Reactive Organic Gases	**Nitrogen Oxides**	**PM_{10}**	**$PM_{2.5}$**
Area Source Emissions	79.37	1.47	2.14	2.13
Energy Emissions	1.12	9.91	0.78	0.78
Mobile Source Emissions	17.94	28.88	53.96	2.44
Total Emissions	98.43	40.26	56.88	5.35
BAAQMD Significance Threshold	**54.0**	**54.0**	**82.0**	**54.0**
Exceed?	**Yes**	**No**	**No**	**No**
Emissions in Tons Per Year				
Area Source Emissions	13.81	0.13	0.11	0.11
Energy Emissions	0.20	1.81	0.14	.14
Mobile Source Emissions	2.67	4.56	6.95	0.39
Total Emissions	16.68	6.50	7.20	0.64
BAAQMD Significance Threshold	**10.00**	**10.00**	**15.00**	**10.00**
Exceed?	**Yes**	**No**	**No**	**No**

[a] Summary reported for winter emissions.

Source: LSA Associates, Inc., 2013.

<u>Impact AIR-3</u>: Implementation of the Station Area Plan could result in a significant cumulative net increase in criteria pollutant emissions. (S)

As shown in Table IV.C-7, implementation of the Station Area Plan would exceed the threshold for operational impacts for criteria pollutants even with implementation of all feasible mitigation measures; therefore, the Station Area Plan would contribute to a cumulatively significant criteria air pollutant impact.

> <u>Mitigation Measure AIR-3</u>: Implement Mitigation Measures AIR-1 and AIR-2. While implementation of Mitigation Measure AIR-3 would reduce this impact, cumulative regional air quality impacts of the project would remain significant and unavoidable. (SU)

(4) Expose Sensitive Receptors to Substantial Pollutant Concentrations. According to the BAAQMD, a project would result in a significant impact if it would: individually expose sensitive receptors to TACs resulting in an increased cancer risk greater than 10.0 in one million, increased non-cancer risk of greater than 1.0 on the hazard index (chronic or acute), or an annual average ambient $PM_{2.5}$ increase greater than 0.3 $\mu g/m^3$. A significant cumulative impact would occur if the project in combination with other projects located within a 1,000-foot radius of the project site would expose sensitive receptors to TACs resulting in an increased cancer risk greater than 100.0 in one million, an increased non-cancer risk of greater than 10.0 on the non-hazard index (chronic), or an ambient $PM_{2.5}$ increase greater than 0.8 $\mu g/m^3$ on an annual average basis. Certain groups of people are more susceptible to health effects associated with air pollution than others. CARB has identified the following groups that are most likely to be affected by air pollution: children under 14 years, the elderly over 65 years, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and open space.

Impact AIR-4: Construction of new projects associated with implementation of the Station Area Plan could result in exposure of sensitive receptors to substantial pollutant concentrations. (S)

The Station Area Plan would be constructed over a period of approximately 15 to 20 years. Construction would result in emissions of dust and diesel exhaust. Toxic construction-related health risks are dependent on the type of construction equipment used and duration of the construction period. Due to the lack of specific construction information, a precise estimate of project construction health risks cannot be determined. To ensure that construction impacts do not adversely affect sensitive receptors, the following mitigation measure shall be implemented:

> Mitigation Measure AIR-4: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:
>
> - For any development project that includes buildings within 1,000 feet of a residential dwelling unit, prior to issuing building permits, a construction health risk assessment shall be conducted to assess emissions from all construction equipment during that phase of construction. Equipment usage shall be modified as necessary to ensure that equipment use would not result in a carcinogenic health risk of more than 10 in 1 million, an increased non-cancer risk of greater than 1.0 on the hazard index (chronic or acute), or an annual average ambient $PM_{2.5}$ increase greater than 0.3 $\mu g/m^3$. (LTS)

According to the BAAQMD's database of permitted sources in the Plan area, permitted sources with TAC emissions are from gasoline stations, sanitation and water districts, and diesel generators associated with various businesses. Additional sources of TACs include dry cleaners which are a source of Perchloroethylene (Perc) a substance known to the State of California as a toxic air contaminant.[7]

Table IV.C-8 lists the permitted sources found in the Plan area or within 1,000 feet of the boundaries of the Plan area. Figure IV.C-1 graphically depicts the location of each source within the Plan area boundaries.

Additionally, high volume roadways within the Plan area, such as Highway 101 are significant sources of toxic air contaminants. Traffic on Highway 101 is one of the primary sources of toxic air contaminants from motor vehicles in the City of Larkspur. Sir Francis Drake Boulevard carries approximately 30,000 to 60,000 average daily vehicles within the Plan limits.

Another potential mobile source of toxic air contaminants would be train operations along the SMART rail line located within the Plan area. When considering the toxic risk from railroad lines, the primary risk from trains occurs when trains are left idling, for example at a rail yard. The SMART Project DEIR from November of 2005[8] evaluated the health risks associated with future SMART

[7] On July 1, 2010, the CARB required the elimination of Perc for use at co-residential dry cleaning facilities. Therefore, use of Perc at facilities that share a wall or are in the same building as a residence is no longer permitted. Additionally, the CARB requires that all use of Perc in dry cleaning be phased out by 2023. The regulations established by the CARB related to dry cleaning will reduce impacts related to Perc exposure to sensitive receptors in the City of Larkspur by 2030.

[8] Sonoma-Marin Area Rail Transit, 2005. *Draft Environmental Impact Report*. November.

Stations including the Larkspur station. The results indicated that the SMART project would not expose sensitive receptors to a significant amount of additional diesel PM emissions. Results of a screening health risk assessment indicate that the SMART project would cause less than two excess cancer cases out of a population of one million at any one location, well below the ten excess cancer cases considered significant by the BAAQMD. Therefore, the SMART project would not expose future sensitive receptors located within the Plan area to substantial pollutant concentrations.

Table IV.C-8: Permitted Sources Located in the Plan Area

Source Number	Stationary Source (address & name)	Distance (feet)	Risk (in a million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)	Hazard Index
1	Sanitary District No 1 101 E. Sir Francis Drake Blvd., Larkspur	0 [a]	13.96	0.025	0.01
2	Maxwell The Cleaner 1401 Larkspur Landing Circle, Larkspur	0 [a]	30.00	0.000	0.08
3	Marin Sanitary Service 565 Jacoby Street, San Rafael	644	0.00	139.00	0.00
4	Ghilotti Bros 525 Jacoby Street, San Rafael	846	NA	NA	NA
5	Chevron Station 301 Sir Francis Drake, Greenbrae	0 [a]	73.15	NA	0.07
6	Drake Shell 295 Sir Francis Drake, Greenbrae	0 [a]	38.36	NA	0.04
7	Rich Readimix Concrete Inc. 101 Rich Street, Greenbrae	654	0.00	0.84	0.00
8	Emporio Rulli 26 Rich Street, Greenbrae	0 [a]	0.00	0.02	0.00
9	Econo Gas 2070 Redwood Highway, Larkspur	0 [a]	27.92	NA	0.03
10	Marin Municipal Water District 220 Nellen Avenue, Corte Madera	0 [a]	NA	NA	NA
11	New WinCup Holdings 195 Tamal Vista Blvd., Corte Madera	471	1.16	3.00	0.01

[a] Source is located within the Plan area.
NA = Not Applicable
Source: Bay Area Air Quality Management District, 2013

Proposed projects that would emit TACs would require review under the BAAQMD rules and regulations or review under CEQA, especially if near sensitive receptors. However, projects with sensitive receptors proposed near localized sources of TAC emissions (e.g., residences to be located near major roadways or stationary sources) could expose new sensitive populations to TACs and $PM_{2.5}$. According to the CARB and BAAQMD, exposure to elevated levels of TACs and $PM_{2.5}$ contributes to elevated health risks. BAAQMD recommends that buffers to avoid the exposure of sensitive receptors to TAC sources should be reflected in General Plan and Specific Plan land use maps, and implementing ordinances. The Station Area Plan does not include buffers between sources and sensitive land uses.

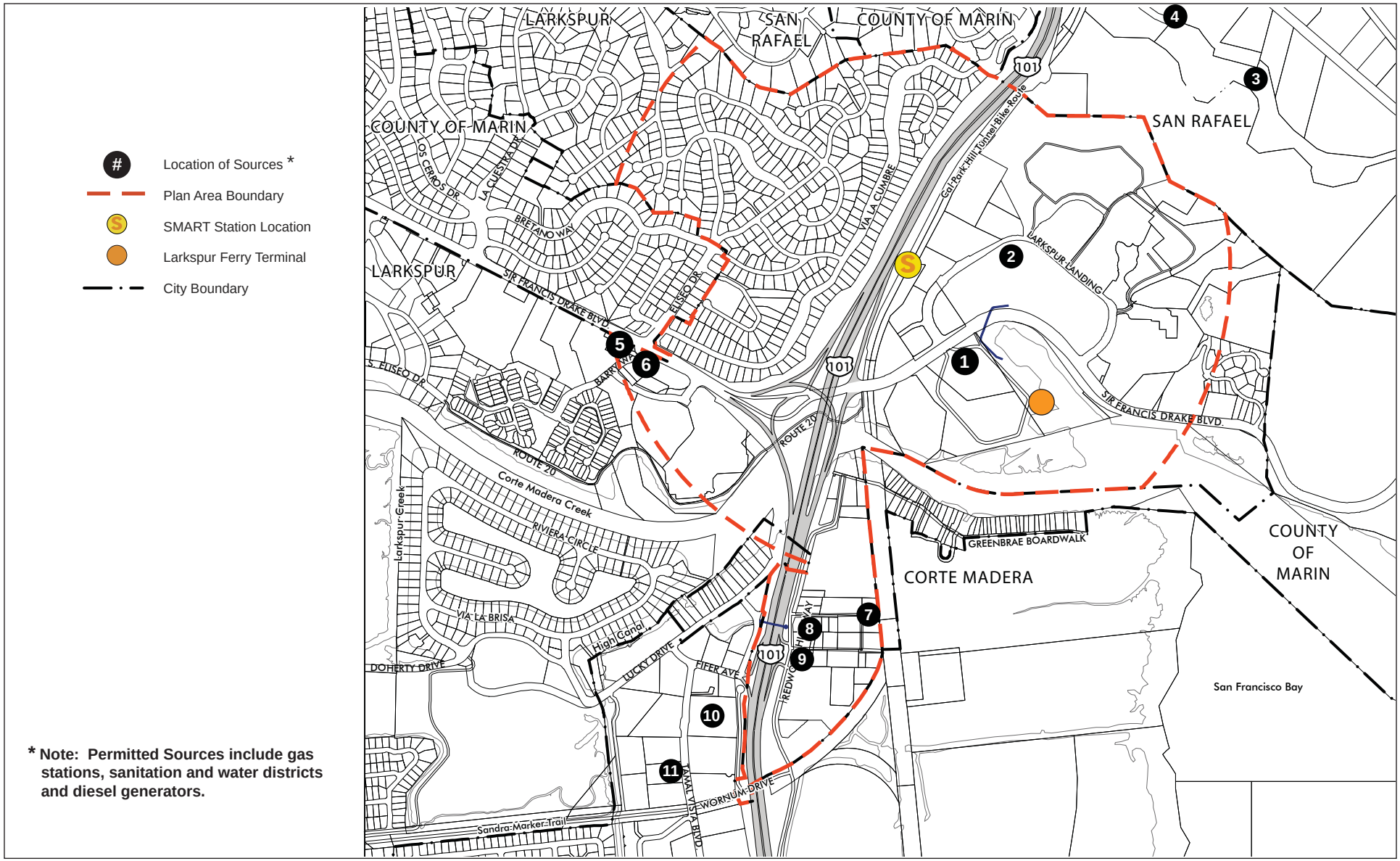
<u>Impact AIR-5</u>: Implementation of the Station Area Plan could result in exposure of sensitive receptors to substantial pollutant concentrations. (S)

As shown in Table IV.C-7 and Figure IV.C-1, there are several sources of air toxic contaminants within the Plan area. Risk levels and $PM_{2.5}$ concentrations drop dramatically beyond 500 feet from a source due to dispersion of emissions with distance. For area plans, the BAAQMD recommends the use of overlay zones around sources of TACs. The Community Risk and Hazard Zones associated with the Station Area Plan are shown in Figure IV.C-2. The precise location of future residential units within the Plan area is unknown at this time. Therefore, to reduce impacts from toxic air contaminants and the individual and cumulative level for future sensitive receptors in the Plan area, the following measure shall be implemented.

> Mitigation Measure AIR-5: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:
>
> - As shown in Figure IV.C-2, residential units proposed within 500 feet of Highway 101, Sir Francis Drake Boulevard and/or any of the stationary sources identified in Table IV.C-7 shall be evaluated for potential health risk exposure. The applicant for a residential project within the Plan area shall prepare a report using the latest BAAQMD permit data and roadway risk estimates to determine impacts to future residents. The report shall outline any measures that would be incorporated into the project necessary to reduce carcinogenic health risk of to less than 10 in 1 million, reduce the non-cancer risk of to less than 1.0 on the hazard index (chronic or acute), and ensure the annual average ambient $PM_{2.5}$ increase is less than 0.3 $\mu g/m^3$. Measures to reduce impacts could include upgrading air filtration systems of fresh air supply, tiered plantings of trees, and site design to increase distance from source to the receptor. (LTS)

(5) Create objectionable odors. The proposed SMART Station within the Plan area would result in a temporary increase in diesel fuel odors during the period of time that a train passes by. This increase would not be considered significant because the emission source is mobile. The diesel odor emitted would quickly dissipate and would not be a constant source of odor. In addition, the BAAQMD has developed a list of the types of facilities known to emit objectionable odors. A passenger rail facility like the proposed SMART Station is not on the list. Therefore, odors associated with the station are not anticipated.

The BAAQMD has only received one unconfirmed odor complaint in the City of Larkspur within the last three years. This complaint is located more than 1,000 feet outside of the SMART Station Area Plan boundaries. Therefore, new residences would not be located in an area that could expose sensitive receptors to odors. Additionally, the new land uses planned under the SMART Station Area Plan are not expected to create objectionable odors. Therefore, the proposed project would not have a substantial impact related to odors.



LSA

FIGURE IV.C-1

0 600 1200
FEET

N

SOURCES: CALIF. GOVERNOR'S OES; CITY OF LARKSPUR, 2011; BMS DESIGN GROUP; LSA ASSOCIATES, INC., 2013.

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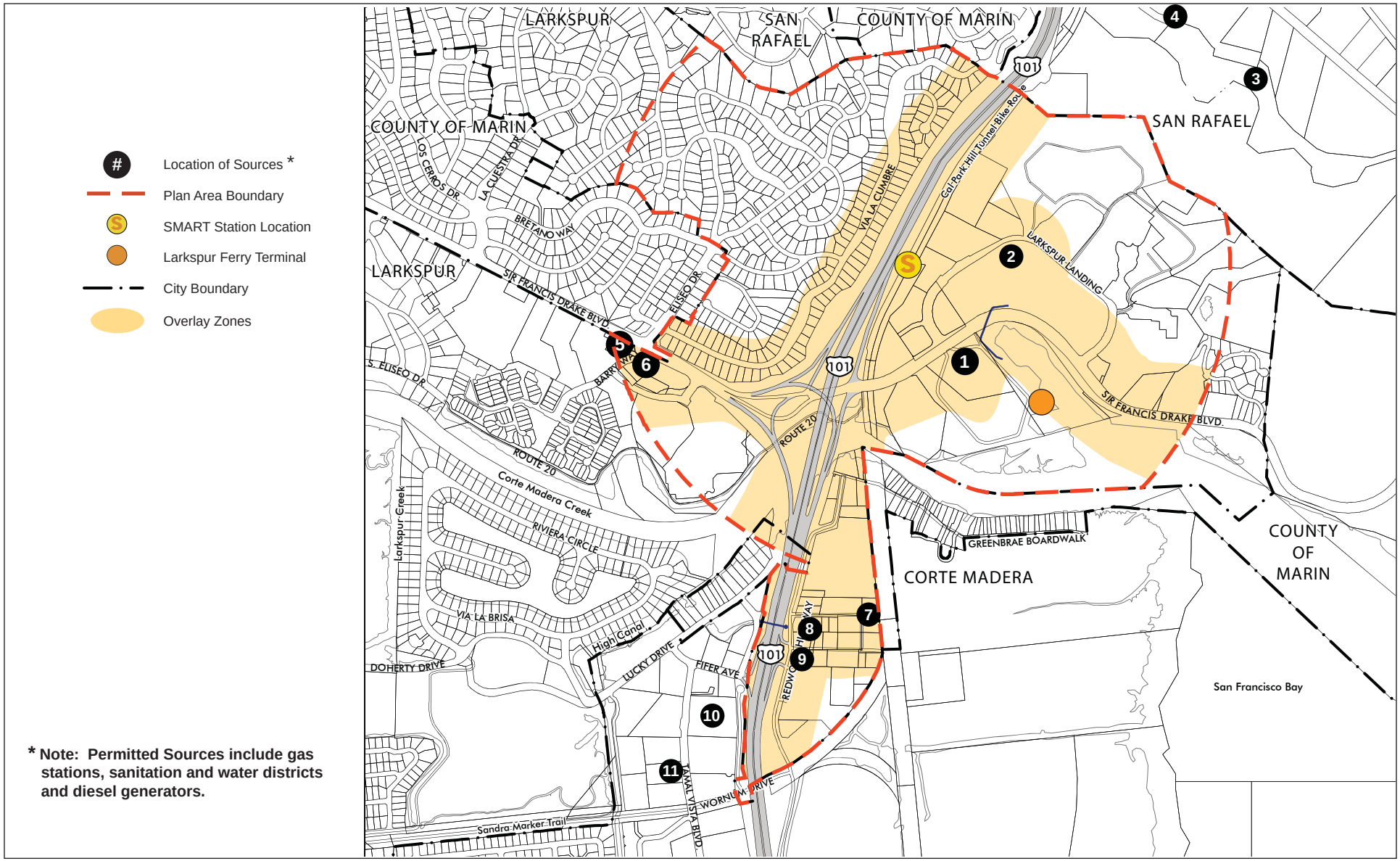
City of Larkspur SMART Station Area Plan EIR

Permitted Toxic Air Contaminant Sources



LSA

FIGURE IV.C-2

0 600 1200
FEET

N

SOURCES: CALIF. GOVERNOR'S OES; CITY OF LARKSPUR, 2011; BMS DESIGN GROUP; LSA ASSOCIATES, INC., 2013.

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City of Larkspur SMART Station Area Plan EIR

Community Risk and Hazard Overlay Zones