5.2 AIR QUALITY

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for the proposed Spring Trails project to impact air quality in the local and regional context. The analysis in this section is based on an air quality analysis completed by The Planning Center based on land uses associated with buildout of the Spring Trails Specific Plan and trip generation provided by Kunzman Associates (2010). The air quality model output sheets are included as Appendix C.

5.2.1 Environmental Setting

South Coast Air Basin

The project site lies within the South Coast Air Basin (SoCAB), which includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The air basin is in a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semipermanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild weather pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds.

Temperature and Precipitation

The annual average temperature varies little throughout the 6,645-square-mile SoCAB, ranging from the low 60s to the high 80s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The Western Regional Climate Center (WRCC) maintains historical climate information for the western United States. Its closest meteorological monitoring station to the project site is the Lytle Creek PH Monitoring Station (ID No. 045215), located approximately 4.5 miles west of the site. According to the WRCC, the average maximum temperature within the local vicinity is 93.0°F in July. The average minimum temperature is reported at 42.8°F in January and February (WRCC 2009).

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all annual rains fall between November and April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. Rainfall averages around 33.14 inches per year in the project area (WRCC 2009).

Humidity

Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SoCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog, especially along the coast, are frequent and low clouds, often referred to as high fog, are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SoCAB.

Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of wind, periods of air stagnation may occur, both in the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the SoCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the transport and diffusion of pollutants by inhibiting their eastward transport. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions.

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These inversions are the marine/subsidence inversion and the radiation inversion. The height of the base of the inversion at any given time is known as the "mixing height." The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area

Air Pollutants of Concern

Criteria Air Pollutants

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. These regulated air pollutants are known as "criteria air pollutants" and are categorized into primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), volatile organic compounds (VOC), 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_x, PM_{10}, and $PM_{2.5}$ are criteria pollutants. VOC and NO_X are criteria pollutant precursors and go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants.

Presented below is a description of each of the primary and secondary criteria air pollutants and their known health effects. Other pollutants, such as carbon dioxide (CO_2), a natural by-product of animal respiration that is also produced in the combustion process, have been linked to such phenomena as global climate change. These greenhouse gases are discussed in Section 5.16, *Greenhouse Gas Emissions*.

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (SCAQMD 2005).

Volatile Organic Compounds (VOC) are compounds comprised primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. VOCs are synonymous with reactive organic gases. Other sources of VOC include evaporative emissions associated with the use of 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 VOC, but rather by reactions of VOC to form secondary pollutants such as ozone (SCAQMD 2005).

Nitrogen Oxides (NO_X) serve as integral participants in the process of photochemical smog production. The two major forms of NO_X are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. NO_X acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens (SCAQMD 2005).

NO_2 is a by-product of fuel combustion. The principal form of NO_2 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 is 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 part per million (ppm). NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 also contributes to the formation of PM_{10}, $PM_{2.5}$, and ozone (SCAQMD 2005).

Sulfur Dioxide (SO_2) is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. Fuel combustion is the primary source of SO_2. 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. A primary source of SO_2 emissions is high-sulfur-content coal. Gasoline and natural gas have very low sulfur content and hence do not release significant quantities of SO_2 (SCAQMD 2005).

Particulate Matter (PM) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of particulates are now recognized. Inhalable particles, or PM_{10}, include the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 one-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 (i.e., 2.5 one-millionths of a meter or 0.0001 inch) or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind action on arid landscapes also contributes substantially to local particulate loading. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems (SCAQMD 2005). Diesel particulates are classified by the California Air Resources Board (CARB) as a carcinogen.

Fugitive dust primarily poses two public health and safety concerns. The first concern is that of respiratory problems attributable to the particulates suspended in the air. The second concern is that of motor vehicle accidents caused by reduced visibility during severe wind conditions. Fugitive dust may also cause significant property damage during strong windstorms by acting as an abrasive material agent (much like sandblasting activities). Finally, fugitive dust can result in a nuisance factor due to the soiling of proximate structures and vehicles (SCAQMD 2005).

Ozone (O_3), or smog, is one of a number of substances called photochemical oxidants that are formed when VOC and NO_X (both by-products of the internal combustion engine) react with sunlight. O_3 is present in relatively high concentrations in the SoCAB, and the damaging effects of photochemical smog are generally related to the concentrations of O_3. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Additionally, O_3 has been tied to crop damage, typically in the form of stunted growth and premature death. O_3 can also act as a corrosive, resulting in property damage such as the degradation of rubber products (SCAQMD 2005).

Toxic Air Contaminants

The public's exposure to toxic air contaminants (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 Health and Safety Code defines 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 subsection (b) of Section 112 of the federal Clean Air Act (42 United States 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 determines the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (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 forth 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 (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 minimize emissions. CARB has, to date, established formal control measures for 11 TACs, all of which 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, toxic air contaminant 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 and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

Since the last update to the TAC list in December 1999, CARB has designated 244 compounds as TACs (CARB 1999). 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 particulate emissions from diesel-fueled engines (diesel PM) as a TAC. Previously, the individual chemical compounds in the diesel exhaust were considered TACs. Almost all diesel exhaust particle mass is 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 lung.

In 2008, the South Coast Air Quality Management District (SCAQMD) conducted its third update to their study on ambient concentrations of TACs and estimated the potential health risks from air toxics. The results showed that the overall risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,200 in a million. The largest contributor to this risk was diesel exhaust, accounting for approximately 84 percent of the air toxics risk (SCAQMD 2008).

Regulatory Framework

The proposed project has the potential to release gaseous emissions of criteria pollutants and dust into the ambient air; therefore, it falls under the ambient air quality standards promulgated at the local, state, and federal levels. The project site is in the SoCAB and is subject to the rules and regulations imposed by the

SCAQMD. However, the SCAQMD reports to CARB, and all criteria emissions are also governed by the California and national ambient air quality standards (AAQS). Federal, state, regional, and local laws, regulations, plans, or guidelines that are potentially applicable to the proposed project are summarized below.

Ambient Air Quality Standards

The federal Clean Air Act (FCAA) was passed in 1963 by the US 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 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 FCAA allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state to achieve and maintain the state AAQS by the earliest practical date. The state AAQS tend to be more restrictive than the federal AAQS and are based on even greater health and welfare concerns.

The 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, those 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.

Both the State of California and the federal government have established health-based AAQS for seven air pollutants. As shown in Table 5.2-1, these pollutants include O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, 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.

Table 5.2-1
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	0.07 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 Average	*	0.03 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	*	
	24 hours	0.04 ppm	0.14 ppm	
Suspended 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 (PM_{10})	150 μg/m^3 (PM_{10})	
Suspended Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m^3	15 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)	Monthly	1.5 μg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	*	1.5 μg/m^3	
Sulfates (SO_4)	24 hours	25 μg/m^3	*	Industrial processes.

Source: CARB 2010
ppm: parts per million; μg/m^3: micrograms per cubic meter
* Standard has not been established for this pollutant/duration by this entity.

Air Quality Management Planning

The SCAQMD and the Southern California Association of Governments (SCAG) are the agencies responsible for preparing the air quality management plan (AQMP) for the SoCAB. Since 1979, a number of AQMPs have been prepared.

The most recent adopted comprehensive plan, which was adopted on June 1, 2007, 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. The 2007 AQMP proposes attainment demonstration of the federal $PM_{2.5}$ standards by 2015 through a more focused control of SO_X, directly emitted $PM_{2.5}$, NO_X, and VOC by 2015. The eight-hour ozone control strategy builds upon the $PM_{2.5}$

strategy, augmented with additional NO_X and VOC reductions to meet the standard by 2024, assuming an extended attainment date is obtained.

The AQMP provides local guidance for the State Implementation Plan, which provides the framework for air quality basins to achieve attainment of the state and federal AAQS. Areas that meet AAQS are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Severity classifications for ozone nonattainment range in magnitude: marginal, moderate, serious, severe, and extreme. The attainment status for the SoCAB is shown in Table 5.2-2. The SoCAB is currently in attainment of the state AAQS for SO_2, CO, and lead (Pb). According to the 2007 AQMP, the SoCAB will have to meet the new federal $PM_{2.5}$ standards by 2015 and the 8-hour ozone standard by 2024, and will most likely have to achieve the recently revised 24-hour $PM_{2.5}$ standard by 2020. The SCAQMD has recently designated the SoCAB as nonattainment for NO_2 (entire basin) and lead (Los Angeles County only) under the California AAQS and attainment/maintenance for PM_{10} under the national AAQS.

Table 5.2-2
Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone – 1-hour	Extreme Nonattainment	No Separate Standard[1]
Ozone – 8-hour	Extreme Nonattainment	Severe-17 Nonattainment[2]
PM_{10}	Serious Nonattainment	Serious Nonattainment[3]
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment[4]
NO_2	Nonattainment[5]	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Nonattainment[6]	Attainment[6]
All others	Attainment/Unclassified	Attainment/Unclassified

Source: CARB, based on 2004 State Area Designations and National Area Designations current as of February 2009.
[1] 1-Hour standard revoked on June 14, 2005.
[2] May petition to Extreme.
[3] Annual standard revoked September 2006. CARB approved SCAQMD's redesignation request from the SoCAB on March 25, 2010.
[4] The USEPA granted the request to redesignate the SoCAB from nonattainment to attainment for the CO NAAQS on May 11, 2007 (Federal Register Volume 71, No. 91), which became effective June 11, 2007.
[5] The state NO_2 standard was strengthened in 2007 from 0.25 ppm to 0.18 ppm. Under the revised standards, the entire SoCAB was designated nonattainment on March 25, 2010. In addition, the EPA adopted a new 1-hour NO_x standard of 0.100 ppm on January 22, 2010.
[6] The Los Angeles portion of the SoCAB was designated nonattainment for lead under the new federal and existing state AAQS as a result of large industrial emitters. Remaining areas within the SoCAB are proposed as unclassified (March 25, 2010).

Baseline Air Quality

Existing levels of ambient air quality and historical trends and projections in the vicinity of the project site are best documented by measurements made by the SCAQMD. The project site is in Source Receptor Area (SRA) 34 (Central San Bernardino Valley). The SCAQMD air quality monitoring station in SRA 34 that is closest to the proposed project site is the San Bernardino – 4th Street monitoring station approximately 9.9 miles to the southeast. The pollutants measured at the San Bernardino station include CO, NO_X, PM_{10}, and $PM_{2.5}$. Air quality data for SO_2 is supplemented from the Fontana – Arrow Highway Monitoring Station approximately 10.8 miles southwest of the project site. Data from these two stations are summarized in Table 5.2-3. The data show recurring violations of both the state and federal O_3 standards. The data also indicate that the area regularly exceeds the state PM_{10} standards and federal $PM_{2.5}$ standards. The CO, SO_2, NO_2, and, $PM_{2.5}$ standards have not been violated in the last five years at this station.

Table 5.2-3
Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Threshold Were Exceeded and Maximum Levels during Such Violations				
	2004	2005	2006	2007	2008
Ozone (O_3)[1]					
State 1-Hour ≥ 0.09 ppm	55	54	57	48	62
State 8-Hour > 0.07 ppm	79	72	72	72	87
Federal 8-Hour > 0.075[2] ppm	56	56	56	51	62
Max. 1-Hour Conc. (ppm)	0.157	0.163	0.154	0.153	0.157
Max. 8-Hour Conc. (ppm)	0.129	0.129	0.126	0.121	0.122
Carbon Monoxide (CO)[1]					
State 8-Hour > 9.0 ppm	0	0	0	0	0
Federal 8-Hour ≥ 9.0 ppm	0	0	0	0	0
Max. 8-Hour Conc. (ppm)	3.24	2.45	2.19	2.27	1.65
Nitrogen Dioxide (NO_2)[1]					
State 1-Hour ≥ 0.18[3] ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.118	0.098	0.088	0.083	0.091
Sulfur Dioxide (SO_2)[4]					
State 24-Hour ≥ 0.04 ppm	0	0	0	0	0
Federal 24-Hour ≥ 0.14 ppm	0	0	0	0	0
Max 24-Hour Conc. (ppm)	0.003	0.004	0.003	0.004	0.003
Coarse Particulates (PM_{10})[1]					
State 24-Hour > 50 μg/m3	25	20	22	26	3
Federal 24-Hour > 150 μg/m3	0	0	0	1	0
Max. 24-Hour Conc. (μg/m3)	118.0	72.0	92.0	219.0	76.0
Fine Particulates ($PM_{2.5}$)[1]					
Federal 24-Hour > 35[5] $\mu g/m^3$	16	3	9	11	1
Max. 24-Hour Conc. ($\mu g/m^3$)	93.4	106.2	55.0	72.1	43.5

Source: South Coast Air Quality Management District, Ambient Air Quality Monitoring Data, obtained April 2009.
Note: ppm: parts per million; $\mu g/m^3$, or micrograms per cubic meter
[1] Data obtained from San Bernardino – 4th Street Monitoring Station
[2] The USEPA revised the 8-hour O_3 standard from 0.08 ppm to 0.075 ppm, effective May 2008.
[3] The NO_X standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm.
[4] Data obtained from the Fontana – Arrow Highway Monitoring Station.
[5] The USEPA revised the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$, effective in December 2006.

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 considered to be 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 can 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. Generally, industrial, commercial, retail, and office areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as 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 public.

Sensitive uses consisting of residential uses are sited immediately to the south of the project site and to the southeast. Other sensitive receptors include residential uses to the west of the project site along West Meyers Road and North Verdemont School and Chavez Middle School, approximately 3,050 feet and 4,075 feet, respectively, to the southeast.

5.2.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

AQ-1 Conflict with or obstruct implementation of the applicable air quality plan.

AQ-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

AQ-3 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).

AQ-4 Expose sensitive receptors to substantial pollutant concentrations.

AQ-5 Create objectionable odors affecting a substantial number of people.

The Initial Study, included as Appendix A1, substantiates that impacts associated with the following threshold would be less than significant: AQ-5

This impact will not be addressed in the following analysis.

South Coast Air Quality Management District Thresholds

Regional Significance Thresholds

CEQA allows for the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. The SCAQMD has established thresholds of significance for air quality for construction activities and project operation, shown in Table 5.2-4:

Table 5.2-4
SCAQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Volatile Organic Compound (VOC)	75 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Nitrogen Oxides (NO_X)	100 lbs/day	55 lbs/day
Sulfur Oxides (SO_X)	150 lbs/day	150 lbs/day
Particulates (PM_{10})	150 lbs/day	150 lbs/day
Fine particulates ($PM_{2.5}$)	55 lbs/day	55 lbs/day

Source: SCAQMD 2007

CO Hotspot Analysis

Localized CO impacts are determined based on the presence of congested intersections. The significance of localized project impacts depends on whether the project would cause substantial concentrations of CO. A project is considered to have significant impacts if project-related mobile-source emissions result in an exceedance of the California one-hour and eight-hour CO standards, which are:

- 1 hour = 20 parts per million
- 8 hour = 9 parts per million

Localized Significance Thresholds

The SCAQMD developed localized significance thresholds (LSTs) for emissions of NO_2, CO, PM_{10}, and $PM_{2.5}$ generated at the project site (offsite mobile-source emissions are not included the LST analysis). LSTs represent the maximum emissions at a project site that are not expected to cause or contribute to an exceedance of the most stringent federal or state AAQS. LSTs are based on the ambient concentrations of that pollutant within the project SRA and the distance to the nearest sensitive receptor. LST analysis for construction is applicable for all projects of five acres and less; however, it can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required. The construction LSTs for a five-acre project site in SRA 34 for sensitive receptors located within 25 meters (approximately 82 feet) are shown in Table 5.2-5. If emissions exceed the LST for a five-acre site, which serves as the screening level criteria, then dispersion modeling needs to be conducted. Use of a five-acre site model for the project site for construction activities would result in more stringent LSTs because emissions would occur in a more concentrated area and closer to the nearest sensitive receptors than in reality. Projects larger than five acres can determine the localized significance for construction by performing dispersion modeling using the thresholds in Table 5.2-6 for emissions that exceed the LSTs shown in Table 5.2-5.

Table 5.2-5
SCAQMD Localized Significance Threshold, Screening Level Analysis

Air Pollutant	Threshold (lbs/day)	
	Construction	Operation
Nitrogen Oxides (NO_2)	270	270
Carbon Monoxide (CO)	1,720	1,720
Coarse Particulates (PM_{10})	14	4
Fine Particulates ($PM_{2.5}$)	8	2

Source: SCAQMD 2003; SCAQMD 2006, for a 5-acre site within SRA 34 with receptors 82 feet (25 meters) from the source.

Table 5.2-6
SCAQMD Localized Significance Thresholds Based on AAQS for Projects Larger than 5 Acres

Air Pollutant (Relevant AAQS)	Concentration
1-Hour CO Standard (CAAQS)	20 ppm
8-Hour CO Standard (CAAQS)	9.0 ppm
1-Hour NO_2 Standard (CAAQS)	0.18 ppm
24-Hour PM_{10} Standard – Construction (SCAQMD)[1]	10.4 $\mu g/m^3$
24-Hour $PM_{2.5}$ Standard – Construction (SCAQMD)[1]	10.4 $\mu g/m^3$
24-Hour PM_{10} Standard – Operation (SCAQMD)[1]	2.5 $\mu g/m^3$
24-Hour $PM_{2.5}$ Standard – Operation (SCAQMD)[1]	2.5 $\mu g/m^3$

Note: ppm – parts per million; μg/m3 – micrograms per cubic meter
[1] Threshold is based on SCAQMD Rule 403. Since the SoCAB is in nonattainment for PM_{10} and $PM_{2.5}$, the threshold is established as an allowable change in concentration. Therefore, background concentration is irrelevant.

5.2.3 Environmental Impacts

The project includes the construction and operation of the proposed Spring Trails project. Construction and operational emissions were calculated using the URBEMIS2007 emissions model. The URBEMIS2007 model compiles an emissions inventory of stationary and vehicle emissions sources. The calculated emissions for the construction phases of the proposed project are compared to the SCAQMD thresholds of significance to determine whether project emissions would result in significant air quality impacts. Dispersion modeling, using the results of the URBEMIS2007 emissions model for project-related construction activities, was conducted using the USEPA's Industrial Source Complex Short Term (ISCST3) dispersion model to analyze concentrations of air pollutants at nearby sensitive receptors. CO hotspot modeling was conducted using the Caline4 dispersion model to analyze concentrations of CO emissions at receptors 10 feet from the edge of the roadway. Air quality modeling is included as Appendix C.

The proposal also includes the annexation of an adjacent 26.4-acre area consisting of six parcels owned by various property owners, with four of the lots occupied. A land use proposal has not been submitted for this 26.4-acre area and it is not owned or otherwise under the control of the applicant. For these reasons, no development is expected to occur on these parcels. Therefore the annexation would not contribute to impacts related to air quality.

Alternative (Overhead Electric Lines) Development Plan

The Spring Trails project assumes that the Southern California Edison (SCE) overhead electric lines that traverse the western portion of the site will be located underground. In the event that the overhead electric lines cannot be located underground, an alternative plan accommodating the lines above ground, as shown in Section 3, *Project Description*, Figure 3-3A*, Alternative (Overhead Electric Lines) Development Plan,* is proposed for the project site. The alternative plan for Spring Trails is the same as the preferred plan in every respect except for the treatment of the land beneath the aboveground electric lines and the number of residential lots. The alternative plan contains 304 single-family detached units (303 new units and 1 existing residence) compared to 307 units proposed in the preferred development plan. Both scenarios are analyzed in this section to assess their respective impacts to air quality.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

IMPACT 5.2-1: ***THE PROPOSED PROJECT WOULD CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) AIR QUALITY MANAGEMENT PLAN BECAUSE CONSTRUCTION-RELATED AIR POLLUTANT EMISSIONS WOULD EXCEED THE SCAQMD REGIONAL AND LOCAL EMISSION THRESHOLDS. [THRESHOLD AQ-1]***

Impact Analysis: A consistency determination plays an important role in local agency project review by linking local planning and individual projects to the AQMP. It fulfills the CEQA goal of informing decision makers of the environmental effects of the project under consideration at an early enough stage to ensure that air quality concerns are fully addressed. It also provides the local agency with ongoing information as to whether they are contributing to clean air goals contained in the AQMP. To accurately assess the environmental impacts of new or renovated development, environmental pollution and population growth are projected for future scenarios. There are two key indicators of consistency:

Indicator 1: Whether the project would result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of the AAQS or interim emission reductions in the AQMP.

Indicator 2: Whether the project would exceed the assumptions in the AQMP. The AQMP strategy is, in part, based on projections from local general plans.

Indicator 1

The SoCAB is designated by the state and EPA as nonattainment for O_3, PM_{10}, and $PM_{2.5}$. SCAQMD developed regional emissions thresholds, shown in Table 5.2-5, to determine whether or not a project would contribute to air pollutant violations. If a project exceeds the regional air pollutant thresholds, then it would significantly contribute to air quality violations in the SoCAB. In addition, it would contribute to air pollutant violations if localized emissions result in an exceedance of the AAQS (Table 5.2-6).

Short-term construction emissions of NO_X, PM_{10}, and $PM_{2.5}$ generated during project-related construction activities would exceed the SCAQMD thresholds for regional emissions (see Impact 5.2-2 and Table 5.2-7) and would significantly elevate localized concentrations of air pollutants (see Impact 5.2-4). Therefore, the project's construction-related emissions would result in a significant air quality impact. The project in regard to short-term emissions would not be consistent with the AQMP under the first indicator.

Long-term emissions from the project would not exceed the SCAQMD thresholds for regional emissions (see Impact 5.2-3 and Table 5.2-8) and would therefore not contribute to an increase in frequency or severity of air quality violations and delay attainment of the AAQS or interim emission reductions in the AQMP. Therefore, the project's operation-related emissions result in a less than significant air quality impact. The project in regard to long-term emissions would be consistent with the AQMP under the first indicator.

Table 5.2-7
Project-Related Regional Construction Emissions
(pounds per day)

Construction Phase[1]	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Mass Grading[2]	71	722	329	<1	455	118
Trenching/Utilities	2	18	9	0	1	1
Asphalt Paving (Access Roads)	4	23	15	0	2	2
Building Construction	8	43	73	<1	3	3
Asphalt Paving	5	28	17	<1	2	2
Architectural Coating	33	<1	1	0	<1	<1
Maximum Daily Construction Emissions	73	**740**	338	<1	**456**	**118**
SCAQMD Regional Significance Threshold	75	100	550	150	150	55
Exceeds Threshold?	No	**Yes**	No	No	**Yes**	**Yes**

Source: URBEMIS2007, Version 9.2.4.
Note: Under SCAQMD Rule 201, a permit to construct must be obtained prior to the start of construction activity.
[1] Construction emissions are based on the construction equipment mix and schedule provided by Rick Engineering Company. Modeling assumes 376,308 cy of export, 224 acres of total grading, and construction of 329 dwelling units and therefore emissions rates presented are conservative.
[2] PM_{10} and $PM_{2.5}$ generated by fugitive dust assumes implementation of SCAQMD Rule 403 for fugitive dust control, which includes dust control measures during ground-disturbing activities: replacing groundcover in disturbed areas quickly, watering exposed surfaces at least two time daily, implementation of equipment loading/unloading procedures to reduce fugitive dust, managing haul road dust by watering two times daily, and reducing speed on unpaved roads to less than 15 mph.

Table 5.2-8
Project-Related Regional Operational Phase Emissions
(in pounds per day)

Operations Phase[1]	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer						
Stationary Sources[2]	21	6	17	0	<1	<1
Mobile Sources	20	26	237	<1	18	9
Maximum Daily Operation Emissions	41	31	254	<1	48	9
SCAQMD Regional Significance Threshold	55	55	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No
Winter						
Stationary Sources[2]	19	8	3	<1	<1	<1
Mobile Sources	22	31	227	<1	48	9
Maximum Daily Operation Emissions	40	39	230	<1	48	10
SCAQMD Regional Significance Threshold	55	55	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No

Source: URBEMIS2007, Version 9.2.4.
Note: Operation emissions are distinguished between summer and winter to account for changes in temperature, fireplace use, differences in gasoline blend, and other factors that may affect emissions from stationary and mobile sources.
[1] Based on the traffic study's analysis of 329 dwelling units and therefore emissions rates presented are conservative.
[2] All fireplaces installed in residential units are assumed to be gas burning in accordance with SCAQMD Rule 445, Wood Burning Devices.

Indicator 2

In general, SCAQMD's AQMP is based on demographic projections (units, population, and employment) in the SCAG's Regional Transportation Plan and associated job-housing ratio on a subregional level. Consequently, SCAG's projections are based on a macrolevel analysis of land uses within each jurisdiction. The project site is in the Verdemont community of unincorporated San Bernardino County and in the City of San Bernardino's sphere of influence (SOI). As shown in Figure 4-6, *Existing Land Use Designations*, under the County's General Plan, the northern portion of the site—approximately 160 acres—is within the San Bernardino National Forest and is private unincorporated land, designated as Resource Conservation (RC). The southern portion of the site, approximately 190.6 acres, is designated as Rural Living (RL-5), which allows up to one dwelling unit per five acres, and is not located within the San Bernardino National Forest. The entire project site is currently prezoned by the City of San Bernardino as Residential Estate (RE), allowing one dwelling unit per acre.

The Local Agency Formation Commission (LAFCO) approved a Sphere of Influence Expansion in September 1996 for the City of San Bernardino that placed the project site and adjacent area within the City of San Bernardino's SOI. The proposed project includes a request for annexation of the project site and adjoining parcels (for a total of approximately 379 acres) into the City of San Bernardino. The annexation process would begin after approval of the project application by the San Bernardino City Council. The planned use would be consistent with the zoning designations of the project site because residential densities would not exceed one dwelling unit per acre. Please refer to Section 5.8, *Land Use and Planning*, of this DEIR for a detailed discussion of the project's consistency with the City of San Bernardino's General Plan land use designation of the project site. Therefore, the proposed project would not have a substantial effect on population, housing, and employment trends in the subregion. Consequently, because the proposed development under the Spring Trails Specific Plan is consistent with the City of San Bernardino General Plan, the project would not exceed the assumptions in the AQMP, which is based, in part, on local general plan projections.

Summary

As described above, the project would not be consistent with the AQMP under the first indicator because short-term construction emissions of NO_X, PM_{10}, and $PM_{2.5}$ associated with the project would exceed the SCAQMD regional and localized significance thresholds, which are the basis for determining if a project would cumulatively contribute to the regional nonattainment designations of the SoCAB. The project would be considered consistent with the AQMP under the second indicator because the project would not exceed assumptions in the AQMP. However, as both indicators would not be met by the proposed project, project and cumulative level impacts are considered significant relative to project consistency with the AQMP.

Alternative (Overhead Electric Lines) Development Plan

Air quality emissions would be similar under the alternative (overhead electric lines) development plan. The alternative would have 304 residential units rather than 307 and the overhead lines would be undergrounded during construction. The difference in residential units would not substantially change the operational air pollutant emissions. Since the SCE electrical lines would be aboveground, site grading would not require additional earth movement. The impacts related to consistency with the AQMP would be significant on a project and cumulative level for both the preferred and alternative project.

IMPACT 5.2-2: ***CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROPOSED PROJECT WOULD GENERATE SHORT-TERM EMISSIONS THAT EXCEED SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S REGIONAL SIGNIFICANCE THRESHOLDS FOR NO_X, PM_{10}, AND $PM_{2.5}$ AND WOULD SIGNIFICANTLY CONTRIBUTE TO THE NONATTAINMENT DESIGNATIONS OF THE SOUTH COAST AIR BASIN FOR OZONE AND PARTICULATE MATTER (PM_{10} AND $PM_{2.5}$). [THRESHOLDS AQ-2 AND AQ-3]***

Impact Analysis: Construction activities produce combustion emissions from various sources, such as onsite heavy-duty construction vehicles, vehicles hauling materials to and from the site, and motor vehicles transporting the construction crew. Grading activities produce fugitive dust emissions (PM_{10} and $PM_{2.5}$) from soil-disturbing activities. Exhaust emissions from construction activities onsite would vary daily as construction activity levels change.

Construction activities associated with new development occurring in the project area would temporarily increase localized PM_{10}, $PM_{2.5}$, VOC, NO_X, and CO concentrations in the project vicinity and regional emissions within the SoCAB. The primary source of construction-related CO, SO_X, VOC, and NO_X emissions is gasoline- and diesel-powered heavy-duty mobile construction equipment. Primary sources of PM_{10} and $PM_{2.5}$ emissions would be clearing activities, excavation and grading operations, construction vehicle traffic on unpaved ground, and wind blowing over exposed earth surfaces. In addition, architectural coating operations can also generate substantial VOC emissions.

Project-related construction air pollutant emissions would occur from construction of the Spring Trails project. Construction of the project is anticipated to commence in 2010 until the anticipated completion year of 2013. Emissions from construction activities were calculated on a daily basis and were compared to the SCAQMD's maximum daily regional emissions thresholds using the URBEMIS2007 computer model. The URBEMIS2007 model was based on construction phasing and construction equipment list provided by Rick Engineering Company. The results of the URBEMIS2007 computer modeling are included in Table 5.2-7. The URBEMIS2007 model runs are included in Appendix C.

As shown in Table 5.2-7, grading activities would result in air pollutant emissions that exceed the SCAQMD regional significance thresholds for NO_X, PM_{10}, and $PM_{2.5}$. All other analyzed pollutants were found to be less than the SCAQMD's significance thresholds. The primary source of NO_X emissions would be from construction equipment exhaust during grading operations. NO_X is a precursor to both the formation of O_3 and particulate matter (PM_{10} and $PM_{2.5}$). The primary sources of PM_{10} and $PM_{2.5}$ would be fugitive dust during grading and clearing during these operations. Emissions of PM_{10} and $PM_{2.5}$ that exceed the SCAQMD's regional significance threshold would significantly contribute to the particulate matter (PM_{10} and $PM_{2.5}$) nonattainment designations of the SoCAB. Consequently, emissions of NO_X, PM_{10}, and $PM_{2.5}$ that exceed the SCAQMD regional significance thresholds would significantly contribute to the O_3 and particulate matter (PM_{10} and $PM_{2.5}$) nonattainment designations of the SoCAB. Project and cumulative level impacts would be significant relative to the project's consistency with the SCAQMD's regional significance thresholds for NO_X, PM_{10}, and $PM_{2.5}$, and the project's contribution to the nonattainment designations of the SoCAB for ozone and particulate matter (PM_{10} and $PM_{2.5}$).

Alternative (Overhead Electric Lines) Development Plan

Air quality operational emissions would be similar under the alternative (overhead electric lines) development plan. Since the SCE electrical lines would be aboveground, site grading would not require additional earth movement. The construction emissions would be similar on a project and cumulative level for either scenario and impacts would be significant.

IMPACT 5.2-3: LONG-TERM OPERATION OF THE PROJECT WOULD NOT GENERATE AIR POLLUTANT EMISSIONS THAT EXCEED SCAQMD'S REGIONAL SIGNIFICANCE THRESHOLDS. [THRESHOLDS AQ-2 AND AQ-3]

Impact Analysis: Mobile- and stationary-source emissions generated by the project were compiled using URBEMIS2007, Version 9.2.4, air pollutant emissions inventory model to estimate project-related increases in air pollutant emissions. Project-related vehicle trips were obtained from the traffic impact analysis conducted by Kunzman Associates (revised January 2010). Based on the trip generation rate in the traffic study, the project would generate a total of 3,149 average daily trips (ADT) at project buildout in Year 2013. Air pollutant emissions modeling is based on mobile- and stationary-source emissions for each of the land uses. The results of the URBEMIS2007 computer modeling are included in Table 5.2-8.

The project would result in an increase of air pollutant emissions for both mobile and stationary sources. However, as shown in the table, project-related emissions would not exceed the SCAQMD regional emissions thresholds for the analyzed pollutants. Therefore, the project would not cumulatively contribute to the O_3, PM_{10}, and $PM_{2.5}$ nonattainment designations of the SoCAB. Consequently, the proposed project's operational air quality impact is considered less than significant.

Alternative (Overhead Electric Lines) Development Plan

Air quality emissions would be similar under the alternative (overhead electric lines) development plan. The alternative would have 304 residential units rather than 307 units. The difference in residential units would not substantially change the operational air pollutant emissions. The long-term air quality impacts would be less than significant on a project and cumulative level for both the preferred and alternative project.

IMPACT 5.2-4: CONSTRUCTION ACTIVITIES ASSOCIATED WITH GRADING OPERATIONS COULD EXPOSE OFFSITE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS OF PM_{10} AND COULD EXPOSE THE EXISTING ONSITE RECEPTOR TO SUBSTANTIAL POLLUTANT CONCENTRATIONS OF BOTH PM_{10} AND $PM_{2.5}$. [THRESHOLD AQ-4]

Impact Analysis: The proposed project could expose sensitive receptors to elevated pollutant concentrations during construction activities if it would cause or contribute significantly to elevated pollutant concentration levels. Unlike the mass (pounds) of construction emissions shown in Table 5.2-7, described in pounds per day, localized concentrations refer to an amount of pollutant in a volume of air (ppm or $\mu g/m^3$) and can be correlated to potential health effects. Table 5.2-5 (also described in pounds per day) calculates the amount of project-related emissions at which localized concentrations would exceed the ambient air quality standards according to the size of the project site and distance to the nearest sensitive receptor.

Thresholds for dispersion modeling are based on the state AAQS, which are the most stringent AAQS that have been established to provide a margin of safety in the protection of the public health and welfare. They are designed to protect the 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. As shown in Table 5.2-9, project emissions would exceed the screening level criteria for LSTs of NO_X, PM_{10}, and $PM_{2.5}$ during project-related grading activities. The maximum emissions of CO from project-related construction activities would not exceed the LST screening level criterion and would therefore not result in substantial CO pollutant concentrations at nearby sensitive receptors.

Table 5.2-9
Project-Related LST Construction Emissions
(in pounds per day)

Source[1]	Pollutants			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Mass Grading[2]	385	191	439	104
Trenching/Utilities	18	8	1	1
Asphalt Paving (Access Roads)	22	12	2	2
Building Construction	31	17	2	2
Asphalt Paving	23	13	2	2
Architectural Coating	0	0	0	0
Maximum Daily Construction Emissions	**403**	199	**440**	**105**
SCAQMD LST Screening Thresholds	270	1,720	14	8
Dispersion Modeling Necessary?	**Yes**	No	**Yes**	**Yes**

Source: URBEMIS2007 Version 9.2.4, and SCAQMD, Localized Significance Methodology, 2003, June, Appendix A: Based on LSTs for a project site in SRA 34 for a 5-acre site and a distance of 25 meters (82 feet) between the source and receptor.
Note: All values are in pounds per day. Values are the maximum daily emissions less on-road emissions from construction activities.
[1] Modeling based on 224 total acres graded and construction of 329 dwelling units and therefore emissions rates presented are conservative.
[2] Fugitive dust emissions assume application of Rule 403, which includes quickly replacing groundcover in disturbed areas, watering exposed surfaces at least two times daily, implementation of equipment loading/unloading procedures to reduce fugitive dust, managing haul road dust by water two times daily, and reducing speed on unpaved roads to less than 15 mph.

Because emissions of NO_X, PM_{10}, and $PM_{2.5}$ would exceed the LST screening level criteria for a five-acre site during grading operations, concentrations generated by project-related construction activities during grading were modeled at nearby sensitive receptors surrounding the site. The proposed project's maximum daily emissions were modeled using the EPA's ISCST3 dispersion model. This model is more accurate because it takes into account project-specific conditions such as meteorological data and source and receptor data. The maximum concentrations for NO_X, PM_{10}, and $PM_{2.5}$ would occur during the overlap of mass grading and trenching operations and are shown in Figures 5.2-1 through 5.2-3. The concentration levels at each receptor location are shown in Table 5.2.10.

Table 5.2-10
Construction Concentrations, Unmitigated (LSTs)

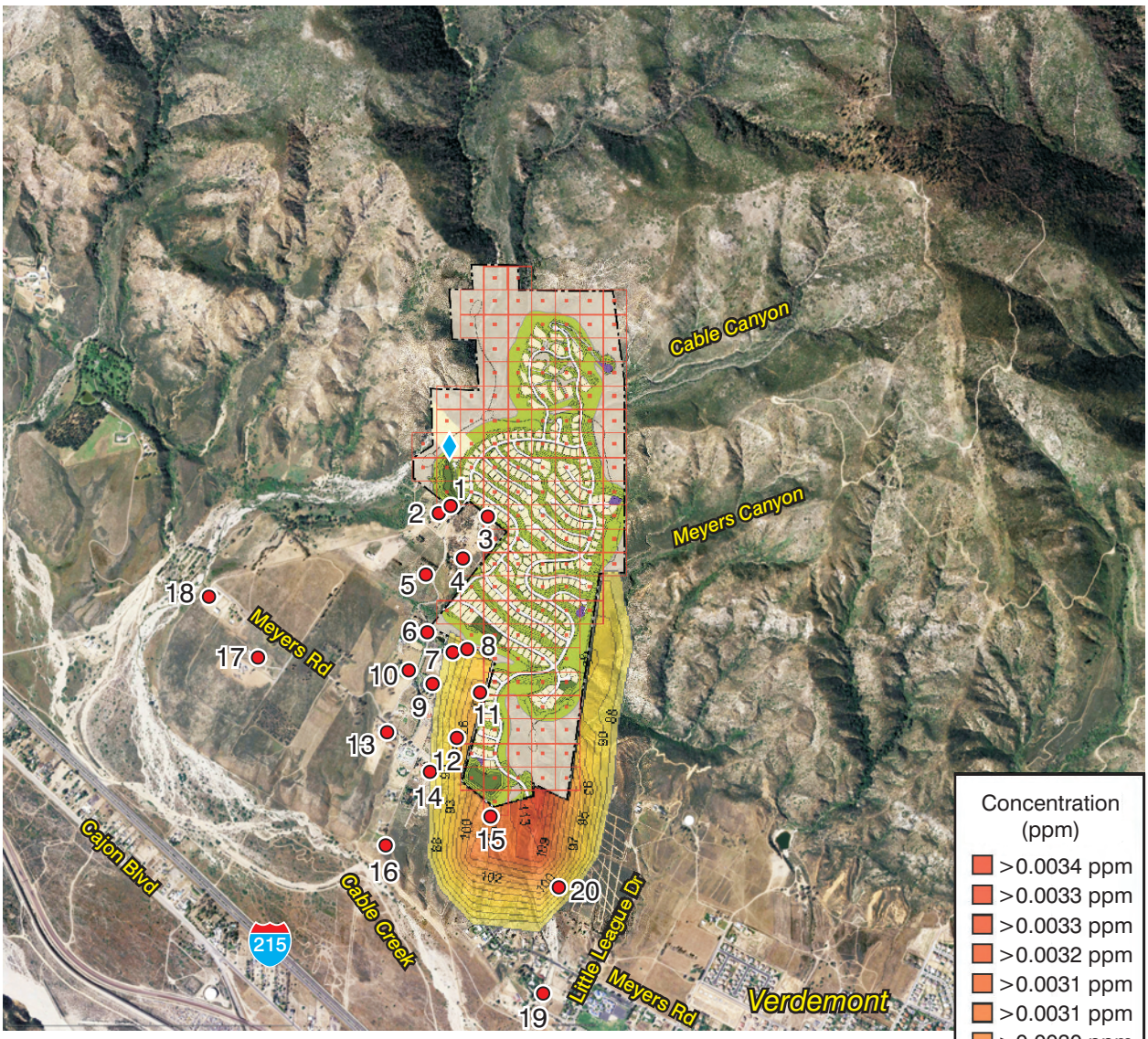
Receptors	NO_2 1 hour (ppm)	PM_{10} 24 hours[1,2] ($\mu g/m^3$)	$PM_{2.5}$ 24 hours[1,2] ($\mu g/m^3$)
Onsite Receptor	--	**>38**	**>10**
Receptor Location 1 (Residence)	--	**>28**	--
Receptor Location 2 (Residence)	--	**>24**	--
Receptor Location 3 (Residence)	--	**>35**	--
Receptor Location 4 (Residence)	--	**>35**	--
Receptor Location 5 (Residence)	--	**>24**	--
Receptor Location 6 (Residence)	--	**>24**	--
Receptor Location 7 (Residence)	--	**>31**	--
Receptor Location 8 (Residence)	--	**>38**	--
Receptor Location 9 (Residence)	--	**>24**	--
Receptor Location 10 (Residence)	--	**>17**	--
Receptor Location 11 (Residence)	--	**>38**	--
Receptor Location 12 (Residence)	--	**>28**	--
Receptor Location 13 (Residence)	--	**>10**	--
Receptor Location 14 (Residence)	--	**>21**	--
Receptor Location 15 (Residence)	--	**>24**	--
Receptor Location 16 (Residence)	--	**--**	--
Receptor Location 17 (Residence)	--	**--**	--
Receptor Location 18 (Residence)	--	**--**	--
Receptor Location 19 (Residence)	--	**--**	--
Receptor Location 20 (Residence)	--	**--**	--
SCAQMD Construction LST Threshold	0.18	10.4	10.4
Significant?	No	**Yes**	**Yes**

Source: ISCST3
ppm; parts per million; $\mu g/m^3$; micrograms per cubic meter
Bold = Exceeds threshold
-- = Does not exceed threshold
[1] Threshold is based on SCAQMD Rule 403.
[2] Since the SoCAB is in nonattainment for PM_{10}, the threshold is established as an "allowable change" in concentration. Therefore, background concentration is irrelevant.
[3] Highest concentration from the last three years of data available.

Nitrogen Oxides

As shown in Figure 5.2-1, the highest concentration of NO_X offsite is 120 $\mu g/m^3$. However the offsite areas that would be exposed to this concentration level do not have any sensitive receptors. This concentration, when converted to parts per million (ppm), would result in a concentration level of approximately 0.1 ppm. At the highest concentration, construction-related emissions of NO_X would not exceed the LST of 0.18 ppm. Additionally, areas with elevated NO_X concentrations would occur primarily in the southern portion of the project site and therefore the existing onsite residence would not be exposed to elevated levels of NO_X. Therefore, project-related construction activities would not expose off- and onsite sensitive receptors to substantial pollutant concentrations of NO_X.

Unmitigated Concentrations of NO_X from Construction Activities



Concentration (ppm)

- >0.0034 ppm
- >0.0033 ppm
- >0.0033 ppm
- >0.0032 ppm
- >0.0031 ppm
- >0.0031 ppm
- >0.0030 ppm
- >0.0029 ppm
- >0.0029 ppm
- >0.0028 ppm
- >0.0027 ppm
- >0.0027 ppm
- >0.0026 ppm
- >0.0025 ppm
- >0.0025 ppm

Note: All concentrations are less than the ambient air quality standard of 0.18 ppm.

—·— Site Boundary

● Receptor Locations

♦ Onsite Receptor

0 2,600
Scale (Feet)

Source: Google Earth Pro 2009

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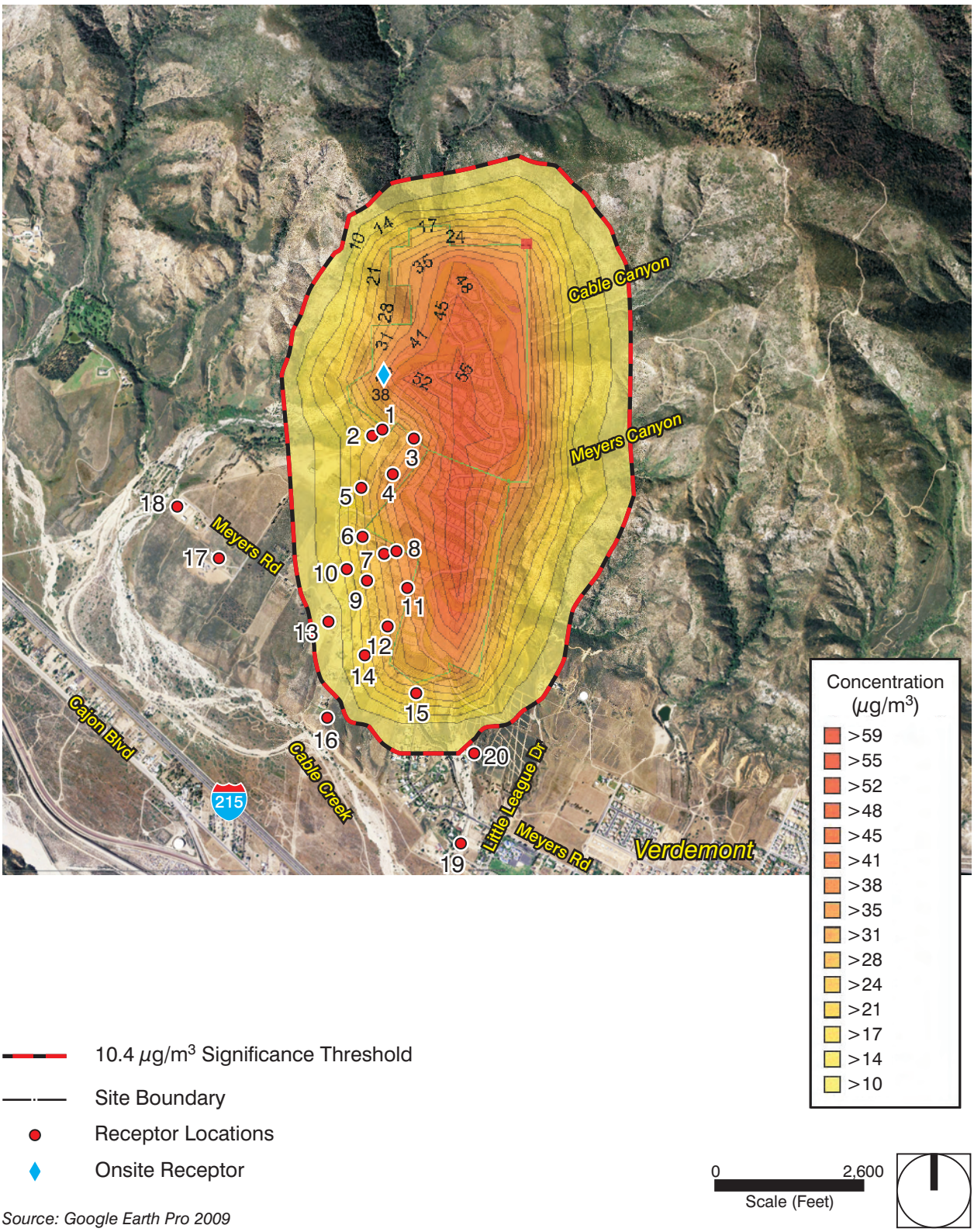
Unmitigated Concentrations of PM_{10} from Construction Activities



Source: Google Earth Pro 2009

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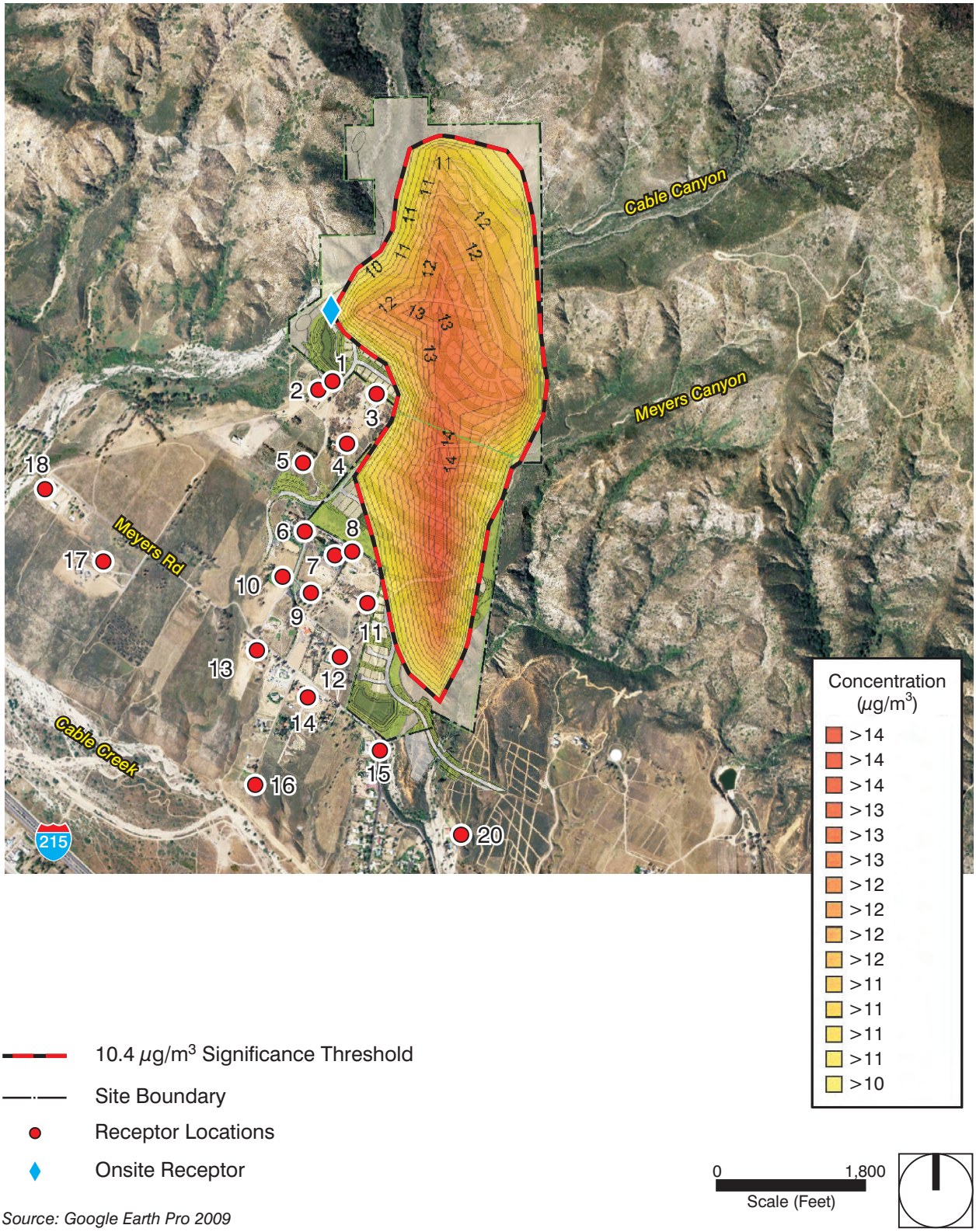
Unmitigated Concentrations of $PM_{2.5}$ from Construction Activities



Source: Google Earth Pro 2009

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Particulate Matter (PM_{10} and $PM_{2.5}$)

As shown in Figure 5.2-3, the concentration of $PM_{2.5}$ would be below the LSTs at the surrounding offsite receptors, but would exceed the LSTs at the existing onsite receptor. In addition, as shown in Figure 5.2-2, construction activities would generate substantial concentrations of PM_{10} at the existing onsite residence and the surrounding offsite receptors. Consequently, the project would expose sensitive receptors to substantial concentrations of PM_{10} and $PM_{2.5}$ during grading activities with project level impacts being potentially significant.

Alternative (Overhead Electric Lines) Development Plan

Air quality operational emissions would be similar under the alternative (overhead electric lines) development plan. Since the SCE electrical lines would be aboveground, site grading would not require additional earth movement. The project-related construction emissions would be similar for either scenario and impacts to sensitive receptors would be potentially significant.

IMPACT 5.2-5: LONG-TERM OPERATION OF THE PROPOSED PROJECT WOULD NOT EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS. [THRESHOLD AQ-4]

Impact Analysis: The project would expose sensitive receptors to elevated pollutant concentrations if it would cause or contribute significantly to elevated pollutant concentration levels. Unlike the mass (pounds) of operational emissions shown in Table 5.2-8 (pounds per day), localized concentrations refer to the amount of pollutant in a volume of air (ppm or $\mu g/m^3$) and can be correlated to potential health effects.

CO Hotspot Analysis

An impact is also potentially significant if emission levels exceed the state or federal ambient air quality standards, thereby exposing receptors to substantial pollutant concentrations. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to AAQS is typically demonstrated through an analysis of localized CO concentrations. Areas of vehicle congestion have the potential to create pockets of CO called hot spots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. Note that the federal levels are based on one- and eight-hour standards of 35 and 9 ppm, respectively. Thus, an exceedance condition would occur based on the state standards before the federal standards.

Hot spots are typically produced at intersections, where traffic congestion is highest because vehicles queue and are subject to reduced speeds. Typically, for an intersection to exhibit a significant CO concentration, it would operate at level of service (LOS) E or worse. Based on the traffic impact analysis prepared by Kunzman Associates (January 2010), under future years with project conditions, the following intersections are projected to operate at LOS E or worse before traffic improvements (see Section 5.14, *Transportation and Traffic*).

- Palm Avenue at I-215 freeway NB ramps (LOS E during AM peak hour and LOS F during PM peak hours for Year 2013)
- Palm Avenue at I-215 freeway SB ramps (LOS F during AM peak hour for Year 2013)

Intersections listed above for Year 2013 are most conducive to the formation of CO hot spots and were modeled during the worst-case peak hour of congestion. Because technological improvements in later-model cars have made significant emissions reductions in CO, background CO concentrations in the SoCAB and vehicle emissions would be lower in Year 2030 than in the project buildout year, Year 2030 conditions were not modeled. Table 5.2-11 lists the one- and eight-hour baselines and project-related CO concentrations that would occur at the study area intersections operating under an LOS E or worse with the proposed project at buildout year plus cumulative growth conditions. Project-related traffic would not exceed any of the state one- or eight-hour CO AAQS at the study area intersections. Consequently, sensitive receptors in the area would not be significantly affected by CO emissions generated by operation of the proposed project. Localized air quality impacts related to mobile-source emissions would therefore be less than significant.

Table 5.2-11
CO Concentrations at Congested Intersections in the Project Vicinity
(parts per million)

Intersection	Highest 1-Hour CO Concentration	1-Hour CAAQS	Highest 8-Hour CO Concentration	8-Hour CAAQS	Exceeds CAAQS	
					1-Hour	8-Hour
Palm Avenue at I-215 NB Ramps	3.5	20	2.5	9	No	No
Palm Avenue at I-215 SB Ramps	3.6	20	2.5	9	No	No

Source: CALINE4. Version 1.31. Based on traffic volumes, roadway configurations, and speed limits obtained from the traffic study prepared by Kunzman Associates, Inc., January 2010. CO concentrations include a background ambient one-hour CO concentration of 2.1 ppm obtained from the SCAQMD, http://www.aqmd.gov/ceqa/handbook/CO/CO.html, for SRA 30 in year 2023. 8-Hour CO concentrations obtained by multiplying 1-Hour CO concentrations by a persistence factor of 70 percent.

Localized Significance Thresholds

To estimate concentrations of air pollutants generated from operation of the project at nearby existing and proposed sensitive receptors, the project's maximum daily operational emissions were compared to the operational LSTs. In accordance with SCAQMD methodology, only onsite stationary sources are included in the analysis. Project-related vehicles traveling on- and offsite are not included in the analysis. Table 5.2-12 shows maximum daily operational emissions generated by the project compared to the LSTs. As shown in this table, project emissions would not exceed the LST screening level criteria for CO, NO_2, PM_{10}, or $PM_{2.5}$, and therefore operation of the proposed project would not expose offsite and onsite sensitive receptors to substantial pollutant concentrations.

Table 5.2-12
Maximum Daily Operational Emissions Compared with the LST

Source[1]	Pollutants (lbs/day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Stationary Source[2]	8	16	<1	<1
Total Onsite Operational Emissions	**8**	**16**	**<1**	**<1**
SCAQMD LST	270	1,720	4	2
Exceeds Threshold	No	No	No	No

Source: URBEMIS2007 Version 9.2.4, and SCAQMD, Appendix A of *Localized Significance Methodology*, June 2003. Based on LSTs for a project site in SRA 21 for a 5-acre site with sensitive receptors within 25 meters (82 feet).
[1] Based on the traffic study's analysis of 329 dwelling units and therefore emissions rates presented are conservative.
[2] All fireplaces installed in residential units are assumed to be gas-burning in accordance with SCAQMD Rule 445, Wood Burning Devices.

Alternative (Overhead Electric Lines) Development Plan

Air quality emissions would be similar under the alternative (overhead electric lines) development plan. The alternative would have 304 residential units rather than 307 units. The difference in residential units would not substantially change the number of stationary- and mobile-source air pollutant emissions. The project-related long-term air quality impacts to sensitive receptors would be less than significant for both the preferred and alternative project.

5.2.4 Cumulative Impacts

In accordance with the SCAQMD methodology, any project that produces a significant project-level regional air quality impact in an area that is in nonattainment adds to the cumulative impact. Cumulative projects include new development and general growth within the project area. The greatest source of emissions within the SoCAB is from mobile sources. Due to the extent of the area potentially impacted by cumulative project emissions, the SCAQMD considers a project cumulatively significant when project-related emissions exceed the SCAQMD regional emissions thresholds shown in Table 5.2-4.

Construction

The SoCAB is in nonattainment for O_3 and particulate matter (PM_{10} and $PM_{2.5}$). Construction of cumulative projects will further degrade the regional and local air quality. Air quality will be temporarily impacted during construction activities. Mitigation measures specified for the proposed project would assist in mitigating these cumulative impacts and can be applied to all similar cumulative projects. However, even with the implementation of mitigation measures, project-related construction emissions would still exceed the SCAQMD significance thresholds for NO_X, PM_{10}, and $PM_{2.5}$, and cumulative emissions would result in greater exceedances. Therefore, the project's contribution to cumulative construction-related air quality impacts would be significant. The cumulative construction-related air quality impacts analysis is applicable to both the preferred development plan and the alternative (overhead electric lines) development plan.

Operation

For operational air quality emissions, any project that does not exceed or can be mitigated to less than the daily regional threshold values is not considered by the SCAQMD to be a substantial source of air pollution and does not add significantly to a cumulative impact. Operation of the project would not result in emissions in excess of the SCAQMD regional emissions thresholds for long-term operation for VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$. Therefore, the project's contribution to cumulative air quality impacts would be less than

significant. The cumulative operational air quality impacts analysis is applicable to both the preferred development plan and the alternative (overhead electric lines) development plan.

5.2.5 Existing Regulations and Standard Conditions

- SCAQMD Rule 201: Permit to Construct
- SCAQMD Rule 203: Permit to Operate
- SCAQMD Rule 402: Nuisance Odors
- SCAQMD Rule 403: Fugitive Dust
- CARB Rule 2840: Airborne Toxics Control Measure
- Building Energy Efficiency Standards (Title 24)
- Appliance Energy Efficiency Standards (Title 20)
- Motor Vehicle Standards (AB 1493)

5.2.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: 5.2-3 and 5.2-5.

Without mitigation, the following impacts would be **potentially significant**:

- Impact 5.2-1 The proposed project is not consistent with the applicable air quality management plan because construction-related air pollutant emissions would exceed the SCAQMD regional and localized emission thresholds. This would be a project and cumulative level significant impact.

- Impact 5.2-2 Construction activities associated with the proposed project would generate short-term emissions that exceed SCAQMD'S regional significance thresholds for NO_x, PM_{10}, and $PM_{2.5}$ and would significantly contribute to the nonattainment designations of the SOCAB for ozone and particulate matter (PM_{10} and $PM_{2.5}$). This would be a project and cumulative level significant impact.

- Impact 5.2-4 Construction activities associated with grading operations could expose sensitive receptors to substantial pollutant concentrations of PM_{10} at the existing onsite residence and the surrounding offsite residences. This would be a project level significant impact.

5.2.7 Mitigation Measures

Impact 5.2-1

Mitigation measures applied for short-term construction activities of the project would lessen impacts associated with Impact 5.2-1.

Impact 5.2-2

Fugitive Dust

2-1 Ongoing during grading and construction, the construction contractor shall implement the following measures in addition to the existing requirements for fugitive dust control under South

Coast Air Quality Management District Rule 403 to further reduce PM_{10} and $PM_{2.5}$ emissions. To assure compliance, the City shall verify that these measures have been implemented during normal construction site inspections:

- During all grading activities, the construction contractor shall reestablish ground cover on the construction site through seeding and watering as quickly as possible. This would achieve a minimum control efficiency for PM_{10} of 5 percent.

- During all construction activities, the construction contractor shall sweep streets with Rule 1186–compliant, PM_{10}-efficient vacuum units on a daily basis if silt is carried over to adjacent public thoroughfares or occurs as a result of hauling.

- During active debris removal and grading, the construction contractor shall suspend grading operations when wind speeds exceed 25 miles per hour. This would achieve an emissions control efficiency of 98 percent for PM_{10} under worst-case wind conditions.

- During all construction activities, the construction contractor shall maintain a minimum 24-inch freeboard on trucks hauling dirt, sand, soil, or other loose materials and tarp materials with a fabric cover or other suitable means. This would achieve a control efficiency for PM_{10} of 91 percent.

- During all construction activities, the construction contractor shall water exposed ground surfaces and disturbed areas a minimum of every three hours on the construction site and a minimum of three times per day. This would achieve an emissions reduction control efficiency for PM_{10} of 61 percent.

- During active debris removal, the construction contractor shall apply water to disturbed soils at the end of each day. This would achieve an emissions control efficiency for PM_{10} of 10 percent.

- During all construction activities, the construction contractor shall limit onsite vehicle speeds on unpaved roads to no more than 15 miles per hour. This would achieve a control efficiency for PM_{10} of 57 percent.

- The construction contractor shall apply chemical soil stabilizers to reduce wind erosion. This would achieve a control efficiency of up to 80 percent.

2-2 During all grading activities, the daily area disturbed shall be limited to a maximum of 35 acres.

Exhaust Emissions

2-3 Ongoing during grading and construction, the construction contractor shall implement the following measures to further reduce construction exhaust emissions of NO_x. To assure compliance, the City shall verify that these measures have been implemented during normal construction site inspections:

- The Project Applicant shall specify in the construction bid that construction contractors are required to use construction equipment rated by the United States Environmental Protection Agency as having Tier 3 or higher exhaust emission limits for equipment over

50 horsepower. A list of construction equipment by type and model year shall be maintained by the construction contractor onsite.

- The construction contractor shall ensure that all construction equipment is properly serviced and maintained to the manufacturer's standards to reduce operational emissions.
- The construction contractor shall limit nonessential idling of construction equipment to no more than five consecutive minutes.

Impact 5.2-4

Mitigation Measures 2-1 through 2-3 would reduce air pollutant emissions associated with the project and would therefore also reduce the concentration of air pollutants at nearby sensitive land uses.

5.2.8 Level of Significance After Mitigation

Impact 5.2-1

Mitigation measures 2-1 through 2-3 would lessen impacts associated with Impact 5.2-1. However, no additional feasible mitigation measures are available to reduce short-term air pollutant emission of NO_X to below the SCAQMD regional thresholds so that the project would not significantly contribute to the nonattainment designation of the SoCAB and thus it would be consistent with the AQMP. Furthermore, emissions of PM_{10} would exceed the SCAQMD localized thresholds. Consequently, Impact 5.2-1 would remain a significant and unavoidable project and cumulative level impact.

Impact 5.2-2

Mitigation Measures 2-1 and 2-2 would reduce PM_{10} and $PM_{2.5}$ emissions from project-related construction activities to below the SCAQMD regional thresholds. Similarly, Mitigation Measure 2-3 would reduce NO_X emissions during construction activities by approximately 31 percent or approximately 149 pounds per day (see Appendix C for more information). However, as shown in Table 5.2-13, NO_X emissions from project-related construction activities would continue to exceed the SCAQMD regional thresholds. Consequently, project and cumulative level impacts would remain significant and unavoidable.

Table 5.2-13
Project-Related Regional Construction Emissions, Mitigated
(pounds per day)

Construction Phase[1]	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Mass Grading[2,3]	71	583	329	<1	114	47
Trenching/Utilities	2	17	9	0	1	1
Asphalt Paving (Access Roads)	4	16	15	0	2	2
Building Construction	8	40	73	<1	3	3
Asphalt Paving	5	22	17	<1	2	2
Architectural Coating	33	<1	1	0	<1	<1
Maximum Daily Construction Emissions	73	**600**	338	<1	115	47
SCAQMD Regional Significance Threshold	75	100	550	150	150	55
Exceeds Threshold?	No	**Yes**	No	No	No	No

Source: URBEMIS2007, Version 9.2.4.
Note: Under SCAQMD Rule 201, a permit to construct must be obtained prior to the start of construction activity.
[1] Construction emissions are based on the construction equipment mix and construction phasing provided by Rick Engineering Company. Modeling assumes 376,308 cy of export, 224 acres of total grading, and construction of 329 dwelling units and therefore emissions rates presented are conservative.
[2] PM_{10} and $PM_{2.5}$ generated by fugitive dust assumes implementation of SCAQMD Rule 403 for fugitive dust control and Mitigation Measures 2-1 and 2-2, which include dust control measures during ground-disturbing activities: replacing groundcover in disturbed areas quickly, watering exposed surfaces at least three time daily, implementation of equipment loading/unloading procedures to reduce fugitive dust, managing haul road dust by watering three times daily, reducing speed on unpaved roads to less than 15 mph, requiring at least 24 inches of freeboard on all haul vehicles, and use of non-toxic soil stabilizers.
[3] NO_x and particulate matter (PM_{10} and $PM_{2.5}$) generated by construction equipment exhaust assume implementation of Mitigation Measure 2-2, that is use of Tier 3 construction equipment for equipment 50 horsepower or greater, which was phased in between 2006 and 2008.

Impact 5.2-4

Mitigation Measures 2-1 through 2-3 would reduce regional construction emissions and therefore reduce localized concentrations of air pollutant emissions during construction activities. Table 5.2-14 shows the LST emissions of air pollutants related to construction with the implementation of mitigation. As shown in this table, construction emissions of NO_X would be reduced to below the LST screening level criteria; however, PM_{10} and $PM_{2.5}$ would continue to exceed the LST screening level criteria. Consequently, dispersion modeling using the ISCST3 model was conducted for concentrations of particulate matter with mitigation.

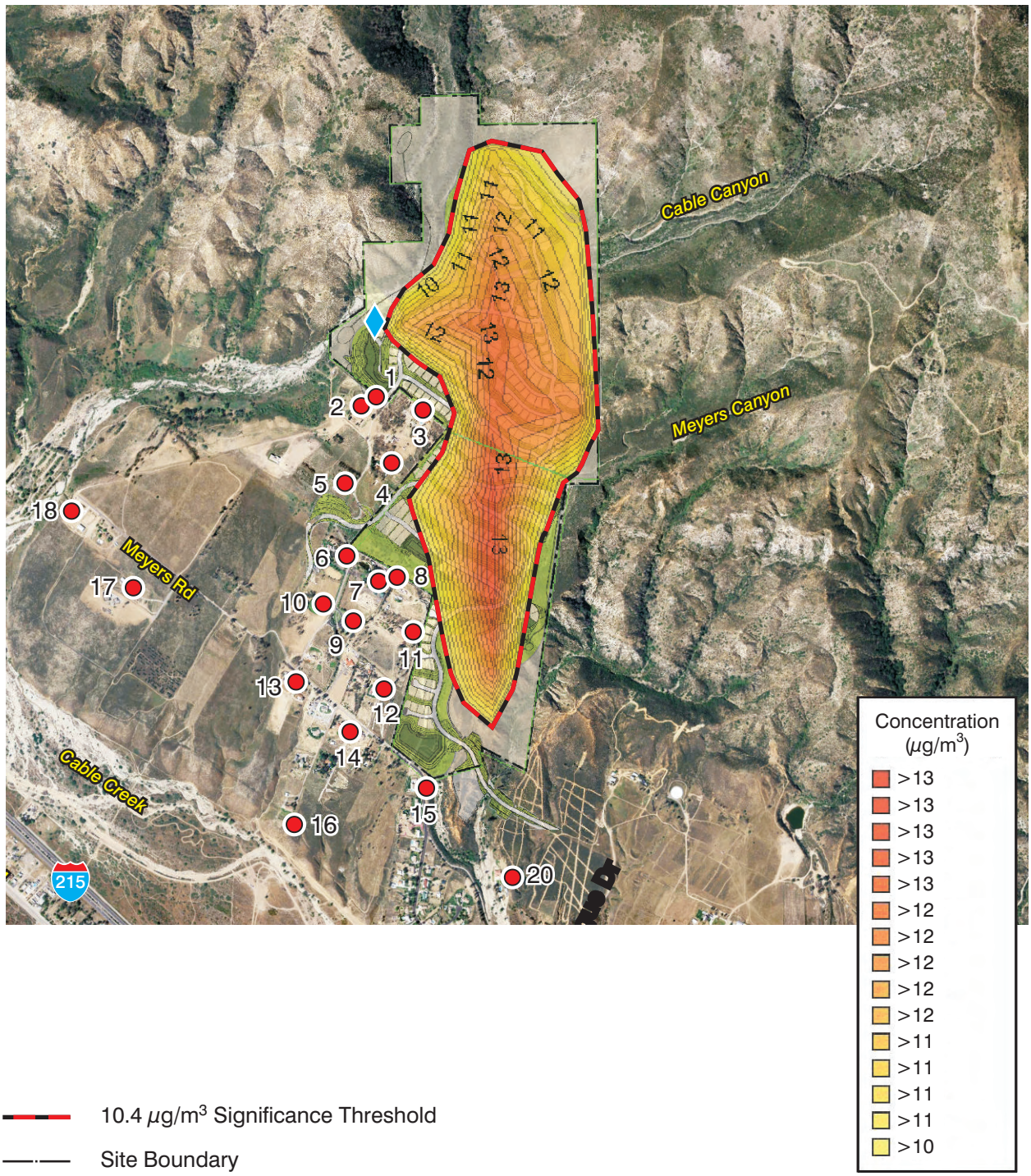
Table 5.2-14
Project-Related LST Construction Emissions, Mitigated

Source[1]	Pollutants			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Mass Grading[2,3]	246	191	100	33
Trenching/Utilities	16	8	1	1
Asphalt Paving (Access Roads)	15	12	2	2
Building Construction	28	17	2	2
Asphalt Paving	16	13	2	2
Architectural Coating	0	0	0	0
Maximum Daily Construction Emissions	264	199	**101**	**34**
SCAQMD LST Screening Thresholds	270	1,720	14	8
Dispersion Modeling Necessary?	No	No	**Yes**	**Yes**

Source: URBEMIS2007 Version 9.2.4, and SCAQMD, Localized Significance Methodology, 2003, June, Appendix A: Based on LSTs for a project site in SRA 34 for a 5-acre site and a distance of 25 meters (82 feet) between the source and receptor.
Note: All values are in pounds per day. Values are the maximum daily emissions less on-road emissions from construction activities.
[1] Modeling based on 224 total acres graded and construction of 329 dwelling units and therefore emissions rates presented are conservative..
[2] PM_{10} and $PM_{2.5}$ generated by fugitive dust assumes implementation of SCAQMD Rule 403 for fugitive dust control and Mitigation Measures 2-1 and 2-2, which include dust control measures during ground-disturbing activities: replacing groundcover in disturbed areas quickly, watering exposed surfaces at least three time daily, implementation of equipment loading/unloading procedures to reduce fugitive dust, managing haul road dust by watering three times daily, reducing speed on unpaved roads to less than 15 mph, requiring at least 24 inches of freeboard on all haul vehicles, and use of non-toxic soil stabilizers.
[3] NO_x and particulate matter (PM_{10} and $PM_{2.5}$) generated by construction equipment exhaust assume implementation of Mitigation Measure 2-2, that is use of Tier 3 construction equipment for equipment 50 horsepower or greater, which was phased in between 2006 and 2008.

The maximum concentrations for PM_{10} and $PM_{2.5}$ from construction activities after mitigation are shown in Figures 5.2-4 and 5.2-5. As shown in the figures, implementation of Mitigation Measures 2-1 and 2-2 would reduce the concentration of PM_{10} and $PM_{2.5}$ at the existing sensitive receptors. The concentration of $PM_{2.5}$ would fall below the AAQS, and therefore localized air quality impacts from construction-related $PM_{2.5}$ would be reduced to less than significant. The concentration of PM_{10} would also be reduced to below the AAQS at the offsite receptors. However, concentrations of this air pollutant (PM_{10}) would continue to exceed the AAQS at the existing onsite receptor. Consequently, even with incorporation of mitigation measures, PM_{10} generated during grading activities would continue to exceed the AAQS and therefore generate substantial concentrations of air pollutants at sensitive receptors. Impact 5.2-4 would remain a significant and unavoidable project level impact for PM_{10}.

Mitigated Concentrations of PM_{10} from Construction Activities



10.4 μg/m^3 Significance Threshold

Site Boundary

Receptor Locations

Onsite Receptor

0 1,800
Scale (Feet)

Source: Google Earth Pro 2009

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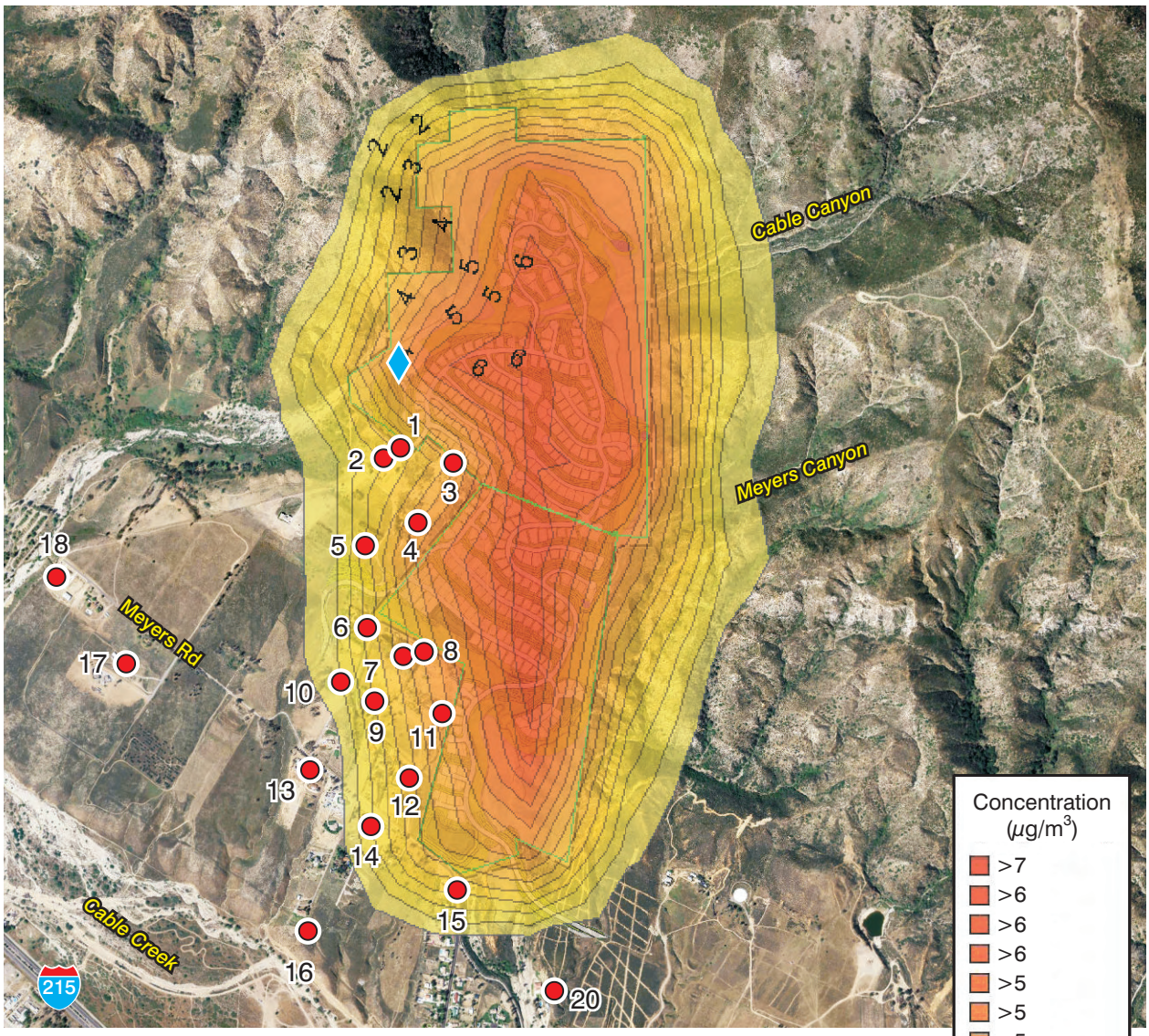
Mitigated Concentrations of $PM_{2.5}$ from Construction Activities



Note: All concentrations are less than SCAQMD's significance threshold of 10.4 $\mu g/m^3$.

10.4 $\mu g/m^3$ Significance Threshold

Site Boundary

Receptor Locations

Onsite Receptor

0 1,800
Scale (Feet)

Source: Google Earth Pro 2009

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