2.3 Air Quality

This section discusses potential impacts to regional and localized air quality resulting from the Newland Sierra Project's (project) construction and operational activities. This section describes the existing air quality setting within the air basin and at the project Site, evaluates potential impacts associated with criteria air pollutants and toxic air contaminants emitted by project-related activities, health risk impacts, and identifies mitigation measures capable of reducing significant impacts to the extent feasible. The analysis is based on the Air Quality Technical Report prepared for the proposed project by Dudek. The Air Quality Technical Report is included as Appendix G to this environmental impact report (EIR).

Comments received in response to the Notice of Preparation (NOP) raised concerns regarding fugitive dust, grading, vehicle miles traveled, air pollution at the Sarver Lane project entry, emissions due to blasting of rock, and attainment of air quality standards. These concerns are addressed and summarized in this section. A copy of the NOP and comment letters received in response to the NOP is included in Appendix A of this EIR.

2.3.1 Existing Conditions

2.3.1.1 Existing Setting

The project Site is located within the San Diego Air Basin (SDAB or basin) and is subject to the San Diego Air Pollution Control District (SDAPCD) guidelines and regulations. The SDAB is one of 15 air basins that geographically divide the State of California. The weather of the San Diego region, as in most of Southern California, is influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average temperature ranges (in degrees Fahrenheit (°F)) from the mid-40s to the high 90s. Most of the region's precipitation falls from November to April with infrequent (approximately 10 percent) precipitation during the summer. The average seasonal precipitation along the coast is approximately 10 inches; the amount increases with elevation as moist air is lifted over the mountains to the east.

The topography in the San Diego region varies greatly, from beaches on the west to mountains and desert on the east. Along with local meteorology, the topography influences the dispersal and movement of pollutants in the basin. The mountains to the east prohibit dispersal of pollutants in that direction and help trap them in inversion layers as described in the next section.

The interaction of ocean, land, and the Pacific High Pressure Zone maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). Local terrain is often the dominant factor inland, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

2.3.1.2 Climate and Meteorology

The SDAB is currently classified as a federal nonattainment area (an area considered to have worse air quality than the National Ambient Air Quality Standards (NAAQS)) for ozone (O_3), and a state nonattainment area (an area considered to have worse air quality than the California Ambient Air Quality Standards (CAAQS)) for O_3, particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$).

The SDAB lies in the southwest corner of California and comprises the entire San Diego region, covering 4,260 square miles, and is an area of high air pollution potential. The basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The SDAB experiences frequent temperature inversions. Subsidence inversions occur during the warmer months as descending air associated with the Pacific High Pressure Zone meets cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. Another type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce O_3, commonly known as smog.

Light daytime winds, predominately from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and oxides of nitrogen (NO_x) emissions. CO concentrations are generally higher in the morning and late evening. In the morning, CO levels are elevated due to cold temperatures and the large number of motor vehicles traveling. Higher CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the basin are associated with heavy traffic. Nitrogen dioxide (NO_2) levels are also generally higher during fall and winter days when O_3 concentrations are lower.

Under certain conditions, atmospheric oscillation results in the offshore transport of air from the Los Angeles region to San Diego County (County). This often produces high O_3 concentrations, as measured at air pollutant monitoring stations within the County. The transport of air pollutants from Los Angeles to San Diego has also occurred within the stable layer of the elevated subsidence inversion, where high levels of O_3 are transported.

<u>Site-Specific Meteorological Conditions</u>

The local climate in northern San Diego County is characterized as semi-arid with consistently mild, warmer temperatures throughout the year. The average summertime high temperature in the project area is approximately 86°F, with highs approaching 89°F in August on average, and record highs approaching 112°F in August. The average wintertime low temperature is approximately 69.3°F, although record lows have approached 25°F in January. Average precipitation in the local area is approximately 15 inches per year, with the bulk of precipitation falling during January and March (WRCC 2015).

Wind in the project area is calm approximately 27 percent of time and 48 percent of time wind blows from the west or southwest. Approximately 46 percent of the time wind is between 1 and 4 knots and 24 percent of time wind is between 4 and 7 knots. Wind exceeding 7 knots occurs less than 3 percent of the time. The average wind for the dataset is 2.59 knots (i.e., 3 miles per hour) from the west-southwest (refer to Appendix F of Appendix G).

2.3.2 Regulatory Setting

2.3.2.1 Federal Regulations

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the Clean Air Act, including setting NAAQS for major air pollutants, hazardous air pollutant standards, approval of state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric O_3 protection, and enforcement provisions.

NAAQS are established by the EPA for “criteria pollutants” under the Clean Air Act, which are O_3, CO, NO_2, sulfur dioxide (SO_2), PM_{10} and $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the nation’s population. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that do not achieve the NAAQS must prepare a State Implementation Plan (SIP) that demonstrates how those areas will attain the standards within mandated time frames.

As mentioned above, the SDAB is currently classified as a federal nonattainment (marginal) area for the 2008 8-hour O_3 standard. The SDAB also is a federal attainment (maintenance) area for 1997 8-hour O_3 standard, and a CO maintenance area (western and central part of the SDAB only, including the project Site) (EPA 2015).

2.3.2.2 State Regulations

California Clean Air Act

The California Clean Air Act was adopted in 1988 and establishes the state's air quality goals, planning mechanisms, regulatory strategies, and standards of progress.

Under the federal Clean Air Act, the task of air quality management and regulation has been legislatively granted to the California Air Resources Board (CARB), with subsidiary responsibilities assigned to air quality management districts and air pollution control districts (such as the SDAPCD) at the regional and county levels. CARB is responsible for ensuring implementation of the California Clean Air Act, responding to the federal Clean Air Act, and regulating emissions from mobile sources such as motor vehicles and construction equipment and consumer products. Pursuant to the authority granted to it, CARB has established the CAAQS, which are generally more restrictive than the NAAQS.

As mentioned above, the SDAB is currently classified as a state nonattainment area (an area considered to have worse air quality than allowed for by the CAAQS) for O_3, PM_{10}, and $PM_{2.5}$ (CARB 2014a).

The NAAQS and CAAQS are presented in Table 2.3-1, Ambient Air Quality Standards.

Toxic Air Contaminants

A toxic air contaminant (TAC) is defined by California law as an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Federal laws use the term hazardous air pollutants to refer to the same types of compounds that are referred to as TACs under state law. California regulates TACs primarily through the Tanner Air Toxics Act (Assembly Bill (AB) 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588).

AB 1807 sets forth a formal procedure for CARB to utilize when designating substances as TACs. This procedure includes pre-designation research, public participation, and scientific peer review.

Pursuant to AB 2588, existing facilities that emit air pollutants above specified levels are required to (1) prepare a TAC emissions inventory plan and report; (2) prepare a risk assessment if TAC emissions are significant; (3) notify the public of significant risk levels; and (4) if health impacts are above specified levels, prepare and implement risk reduction measures.

The following CARB-adopted regulatory measures and Health & Safety Code requirements pertain to the reduction of diesel particulate matter (the primary TAC associated with the proposed project's construction-related activities) and other criteria pollutant emissions from off-road equipment and on-road and off-road vehicles:

Idling of Commercial Heavy Duty Trucks (13 CCR Section 2485)

In July 2004, CARB adopted an Airborne Toxic Control Measure (ATCM) to control emissions from idling trucks. The ATCM prohibits idling for more than 5 minutes for all commercial trucks with a gross vehicle weight rating over 10,000 pounds. The ATCM contains an exception that allows trucks to idle while queuing or involved in operational activities.

In-Use Off-Road Diesel-Fueled Fleets (13 CCR Section 2449 et seq.)

In July 2007, CARB adopted an ATCM for in-use off-road diesel vehicles. This regulation requires that specific fleet average requirements be met for NO_x and particulate matter. Where average requirements cannot be met, Best Available Control Technology requirements apply. The regulation also includes several recordkeeping and reporting requirements.

In-Use On-Road Diesel-Fueled Vehicles (13 CCR Section 2025)

In December 2008, CARB adopted an ATCM to reduce NO_x and PM from most in-use on-road diesel trucks and buses with a gross vehicle weight rating greater than 14,000 pounds. The ATCM requires truck fleets to limit their NO_x and PM through a combination of exhaust retrofit equipment and new vehicles.

California Health and Safety Code Section 41700

This section of the Health and Safety Code states that a person cannot discharge, from any source whatsoever, quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

For purposes of CEQA, the preparation of health risk assessments (HRAs) to evaluate the human health-based consequences of TAC emissions for land use development projects may be warranted under two sets of circumstances: (1) a proposed project itself generates TACs as a result of construction and/or operational activities that may adversely impact sensitive receptors (e.g., residents) and/or (2) a proposed project is located in an area that may adversely expose sensitive receptors associated with its proposed land uses to significant concentrations of TACs from existing stationary and/or mobile sources of TACs (e.g., a fossil-fueled power plant, a high-volume freeway or roadway, a gas station, etc.). Various documents have been issued and updated over the years to provide guidance and recommendations on how HRAs should be prepared, what factors should be evaluated, and what significance thresholds should be considered. For example, both the California Air Pollution Control Officers Association (CAPCOA) and the California Office of Environmental Health Hazard Assessment (OEHHA) have issued guidance documents addressing the preparation of HRAs. OEHHA's "Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments" (OEHHA 2015) is considered the most current and comprehensive set of methodological guidelines in California for conducting HRAs.

CAPCOA's "Health Risk Assessments for Proposed Land Use Projects" (CAPCOA 2009) identifies typical thresholds of significance used by air districts for the two categories of projects that have the potential to result in exposure to TACs: Type A and Type B Projects. Type A Projects are land-use projects that emit TACs through their construction or operation with impacts to sensitive receptors, and Type B Projects are land-use projects with sensitive receptors that would be impacted by nearby, existing sources of TACs. For Type A Projects, CAPCOA notes that, "for the majority of the air districts[,] the excess cancer risk significance threshold is set at 10 in a million. For TACs with acute or chronic, non-carcinogenic health effects, a hazard index of one must not be exceeded" (CAPCOA 2009). For Type B Projects, CAPCOA states that "air districts have historically recommended CEQA thresholds for air pollutants in the context of the air district's clean air attainment plan, or (in the case of toxic air pollutants) within the framework of a rule or policy that manages risks and exposures due to toxic pollutants" (CAPCOA 2009). In effect, CAPCOA recognizes that an HRA-related threshold applicable to a Type A Project may be equally applicable to a Type B Project.

The 2015 OEHHA Guidelines mentioned above did not establish or recommend thresholds of significance for health impacts. However, thresholds of significance are in use in air districts around the state, including the Bay Area, San Joaquin, South Coast, and San Diego air districts. The air districts in those regions have established recommended incremental cancer risk and noncancer health hazard index thresholds for projects that have the potential to expose sensitive receptors to TACs. While air districts do not regulate mobile source emissions or projects that are exposed to mobile or stationary source emissions, the thresholds these districts establish are considered appropriate for use in conducting HRAs by cities and counties in these same districts.

An overview of available air district-specific recommendations is provided below:

- The South Coast Air Quality Management District established an incremental/excess cancer risk thresholds of 10 in 1 million for notification purposes and 25 in 1 million for application of risk reduction measures.
- The San Joaquin Valley Air Pollution Control District established a cancer risk threshold of 20 in 1 million.
- The Bay Area Air Quality Management District initially recommended use of an incremental cancer risk threshold of 10 in 1 million for a single source of TACs, 100 in 1 million for multiple (cumulative) sources of TACs, and a hazard index of 1.0 for Type B Projects; however, the district's significance thresholds were subject to litigation and the district currently advises "the Thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts."
- The SDAPCD has established public health risk notification thresholds (SDAPCD Rule 1210), including an incremental cancer risk threshold of 10 in 1 million and acute and chronic noncancer health hazard index of 1.0.

Relatedly, as is common practice in other air districts around the state, the County's "Air Quality CEQA Guidelines for Determining Significance" (2007), which was based on SDAPCD Rule 1200 (Toxic Air Contaminants – New Source Review), used SDAPCD's thresholds for residential or mixed use projects that are adjacent to stationary sources (such as an industrial plant or gas station) and/or mobile sources (such as a freeway) and have the potential to create an incremental cancer risk or a noncancer-related acute or chronic health impacts within the future population of a proposed project.

2.3.2.3 Local Regulations

San Diego Air Pollution Control District

CARB is responsible for the regulation of mobile emissions sources within the state, and local air quality management districts and air pollution control districts are responsible for enforcing standards and regulating stationary sources. The project Site is located within the jurisdictional boundaries of the SDAPCD. As discussed in more detail above, among other jurisdictional responsibilities, SDAPCD regulates existing, modified, and new stationary sources of air pollutants, prepares and adopts regional plans for the attainment of federal and state air quality standards, establishes requirements and thresholds for projects subject to SDAPCD jurisdiction conducting HRAs and other air quality assessments, and maintains guidance documents for various types of projects in the San Diego Air Basin.

Federal Attainment Plans

The SDAPCD's Eight-Hour Ozone Attainment Plan for San Diego County concludes that local controls and state programs would allow the region to reach attainment of the federal 1997 8-hour O_3 standard (SDAPCD 2007). In this plan, SDAPCD relies on the Regional Air Quality Strategy (RAQS) to demonstrate how the region will comply with the federal O_3 standard. The RAQS details how the region will manage and reduce O_3 precursors (NO_x and volatile organic compounds [VOCs]) by identifying measures and regulations intended to reduce these contaminants. The control measures identified in the RAQS generally focus on stationary sources; however, the emissions inventories and projections in the RAQS address all potential sources, including those under the authority of CARB and the EPA. Incentive programs for reduction of emissions from heavy-duty diesel vehicles, off-road equipment, and school buses are also established in the RAQS. The latest revision to the RAQS was released in December 2016 (SDAPCD 2016a).

As discussed in the Redesignation Request and Maintenance Plan for the 1997 National Ozone Standard for San Diego County,[1] the SDAB reached attainment of the federal 1997 standard in 2011 (SDAPCD 2012). This redesignation request demonstrates the region's attainment of the 1997 O_3 NAAQS and outlines the plan for maintaining attainment status.

Regarding the 2008 8-hour O_3 standard, the SDAPCD prepared the 2008 Eight-Hour Ozone Attainment Plan for San Diego County, which was released in December 2016 (SDAPCD 2016b).

State Attainment Plans

The SDAPCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the CAAQS in the SDAB. The RAQS for the SDAB was initially adopted in 1991, and most recently updated in 2016 (SDAPCD 2016a). The RAQS identifies the plans and control measures designed by SDAPCD to attain the state air quality standards for O_3. (Although the RAQS does not expressly include plans or control measures designed to attain the NAAQS, the CAAQS generally are more stringent than the NAAQS; therefore, plans like the RAQS designed to assist the SDAB in achieving attainment for the CAAQS also would assist the basin in achieving NAAQS attainment status.) The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, and information regarding projected growth for the cities and for San Diego County, to project future emissions and determine the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections

[1] For purposes of this analysis, the relevant federal air quality plan is the Ozone Maintenance Plan (SDAPCD 2012). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the SDAB.

and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the cities and San Diego County as part of the development of their general plans.

In December 2005, the SDAPCD prepared a report, titled *Measures to Reduce Particulate Matter in San Diego County*, to address implementation of Senate Bill (SB) 656 in San Diego County (SDAPCD 2005). (SB 656 required additional controls to reduce ambient concentrations of PM_{10} and $PM_{2.5}$.) In the report, the SDAPCD evaluated the implementation of source control measures that would reduce particulate matter emissions associated with residential wood combustion; various construction activities, including earthmoving, demolition, and grading; bulk material storage and handling; carryout and trackout removal and cleanup methods; inactive disturbed land; disturbed open areas; unpaved parking lots/staging areas; unpaved roads; and windblown dust.

SDAPCD Rules and Regulations

As stated above, the SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient air quality standards in the SDAB. The following rules and regulations apply to all sources in the jurisdiction of SDAPCD, and would apply to the proposed project:

1. **SDAPCD Regulation IV: Prohibitions; Rule 51: Nuisance.** Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property (SDAPCD 1969).
2. **SDAPCD Regulation IV: Prohibitions; Rule 55: Fugitive Dust.** Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive disturbed areas, as well as track-out and carry-out onto paved roads beyond a project site (SDAPCD 2009b).
3. **SDAPCD Regulation IV: Prohibitions; Rule 67.0.1: Architectural Coatings.** Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories (SDAPCD 2015a).

SDAPCD Guidance on the Preparation of HRAs

As discussed above, SDAPCD Rule 1210 (Toxic Air Contaminants Public Health Risks—Public Notification and Risk Reduction) is applicable to stationary sources under SDACPD's jurisdiction that are required to prepare an HRA pursuant to Section 44360 of the Health and Safety Code. Rule 1210 and serves as the foundation for the significance thresholds for purposes of determining incremental cancer risk and noncancer health impacts. Additionally, SDAPCD's

"Supplemental Guidelines for Submission of Air Toxics 'Hot Spots' Program Health Risk Assessments" (2015) supplement the OEHHA guidance manual and address the specific modeling and user default options for the risk evaluation incorporated into the Hot Spots Analysis and Reporting Program (HARP) developed by CARB, OEHHA, and CAPCOA. (HARP is the program used for preparing HRAs.) The Supplemental Guidelines established the required elements of an HRA.

San Diego County

San Diego County General Plan

Air quality resources are covered in the Conservation and Open Space Element of the County's General Plan. The Conservation and Open Space Element is detailed below, along with policies applicable to the proposed project.

Conservation and Open Space Element

Air pollutant emissions sources in the SDAB are typically grouped into two categories: stationary and mobile sources. Mobile source emissions can be attributed to vehicles and transportation-related activities. Stationary sources can be further divided into two major subcategories: point and area sources. Point source emissions originate from manufacturing and industrial processes. A goal of the County is to use land use development techniques and patterns that reduce emissions of criteria pollutants through minimized transportation and energy demands while protecting public health and contributing to a more sustainable environment. As the County continues to develop, projects are expected to incorporate building design and construction techniques that reduce emissions of criteria pollutants while protecting public health and contributing to a more sustainable environment. Applicable General Plan policies are as follows (County of San Diego 2011):

- **Policy COS-14.1:** Land Use Development Form. Require that development be located and designed to reduce vehicular trips (and associated air pollution) by utilizing compact regional and community-level development patterns while maintaining community character.
- **Policy COS-14.2:** Villages and Rural Villages. Incorporate a mixture of uses within Villages and Rural Villages that encourage people to walk, bicycle, or use public transit to reduce air pollution and GHG emissions.
- **Policy COS-14.8**: Minimize Air Pollution. Minimize land use conflicts that expose people to significant amounts of air pollutants.
- **Policy COS-14.9**: Significant Producers of Air Pollutants. Require projects that generate potentially significant levels of air pollutants and/or GHGs such as quarries, landfill

operations, or large land development projects to incorporate renewable energy, and the best available control technologies and practices into the project design. The recovered methane from landfills can be pumped through turbines to generate power. This provides a mutual benefit by generating energy and reducing the amount of CO_2 and methane being released from landfills. Other uses for closed facilities include photovoltaic (solar) panels, wind, and microturbines, as appropriate for the area they would be located in.

- **Policy COS-14.10**: Low-Emission Construction Vehicles and Equipment. Require County contractors and encourage other developers to use low-emission construction vehicles and equipment to improve air quality and reduce GHG emissions.
- **Policy COS-15.1:** Design and Construction of New Buildings. Require that new buildings be designed and constructed in accordance with "green building" programs that incorporate techniques and materials that maximize energy efficiency, incorporate the use of sustainable resources and recycled materials, and reduce emissions of GHGs and toxic air contaminants.
- **Policy COS-15.4**: Title 24 Energy Standards. Require development to minimize energy impacts from new buildings in accordance with or exceeding Title 24 energy standards.
- **Policy COS-15.6:** Design and Construction Methods. Require development design and construction methods to minimize impacts to air quality.
- **Policy COS-16.1:** Alternative Transportation Modes. Work with SANDAG and local transportation agencies to expand opportunities for transit use. Support the development of alternative transportation modes, as provided by Mobility Element policies.
- **Policy COS-16.2**: Single-Occupancy Vehicles. Support transportation management programs that reduce the use of single-occupancy vehicles.
- **Policy COS-16.3**: Low-Emissions Vehicles and Equipment. Require County operations and encourage private development to provide incentives (such as priority parking) for the use of low- and zero-emission vehicles and equipment to improve air quality and reduce GHG emissions. [Refer also to Policy M-9.3 (Preferred Parking) in the Mobility Element.]
- **Policy COS-20.3:** Regional Collaboration. Coordinate air quality planning efforts with federal and State agencies, SANDAG, and other jurisdictions.

***County Code Section 87.428, Dust Control Measures*.** As part of the San Diego County Grading, Clearing, and Watercourses Ordinance, County Code Section 87.428 requires all clearing and grading to be carried out with dust control measures adequate to prevent creation of a nuisance to persons or public or private property. Clearing, grading, or improvement plans shall require that measures such as the following be undertaken to achieve this result: watering, application of surfactants, shrouding, control of vehicle speeds, paving of access areas, or other operational or technological measures to reduce dispersion of dust. These project design measures are to be incorporated into all earth-disturbing activities to minimize the amount of particulate matter emissions from construction (County of San Diego 2004).

2.3.3 Background Air Quality

2.3.3.1 Pollutants and Effects

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards (NAAQS and CAAQS) for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include: O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead. These pollutants are discussed below.[2]

Ozone. O_3 is a colorless gas that is formed in the atmosphere when VOCs, sometimes referred to as reactive organic gases (ROGs), and NO_x react in the presence of ultraviolet sunlight. O_3 is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants (VOCs and NO_x) directly emitted into the atmosphere. The primary sources of VOCs and NO_x, the precursors of O_3, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in O_3 formation and ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes.

Nitrogen Dioxide. Most NO_2, like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide and atmospheric oxygen. Nitric oxide and NO_2 are collectively referred to as NO_x, and are major contributors to O_3 formation. High concentrations of NO_2 can cause breathing difficulties and result in a brownish-red cast to the atmosphere with reduced visibility. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis, and some increase in bronchitis in children (2 and 3 years old) has also been observed at concentrations below 0.3 parts per million (ppm).

[2] The descriptions provided herein regarding the health effects of criteria air pollutants are based on published information contained in the EPA's Six Common Air Pollutants (EPA 2014b) and CARB's Glossary of Air Pollutant Terms (CARB 2013).

Carbon Monoxide. CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. The highest levels of CO typically occur during the colder months of the year when surface inversion conditions are more frequent. In terms of health, CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can be dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary sources and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Fine particulate matter, or $PM_{2.5}$, is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_X), NO_x, and VOCs. Inhalable or coarse particulate matter, or PM_{10}, is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections.

Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport absorbed gases, such as chlorides or ammonium, into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, and produce haze and reduce regional visibility.

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline, the manufacturing of batteries, paint, ink, ceramics and ammunition, and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline for motor vehicles reduced the overall inventory of airborne lead by nearly 95 percent. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emission sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance including intelligence quotient performance, psychomotor performance, reaction time, and growth.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as ROGs). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

Non-Criteria Pollutants

Toxic Air Contaminants

A TAC is defined by California law as an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Federal laws use the term hazardous air pollutants to refer to the same types of compounds that are referred to as TACs under state law. The state list of TACs identifies about 700 plus substances and the federal list of hazardous air pollutants identifies 189 substances. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC. Examples include certain aromatic and chlorinated hydrocarbons, certain metals, asbestos, and particulate matter including diesel particulate matter (DPM).

DPM is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70 percent of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with diesel particulate matter, CARB adopted a diesel risk reduction plan in 2000.

Odorous Compounds

Odors are generally regarded as an annoyance, and the ability to detect odors varies considerably among the population and overall is quite subjective. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting and headache). Further, an odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Crystalline Silica

Crystalline silica is a basic component of soil, granite, sand, and other minerals. Quartz is the most common form of crystalline silica; however, all forms may become respirable-sized particles when workers chip, cut, drill, or grind objects that contain crystalline silica (OSHA 2002).

Toxicology of Crystalline Silica

Inhalation of crystalline silica initially causes respiratory irritation and an inflammatory reaction in the lungs. Silicosis results from chronic exposure and is characterized by the presence of histologically unique silicotic nodules and by fibrotic scarring of the lung. Lung diseases other than cancer associated with silica exposure include silicosis, tuberculosis/silicotuberculosis, chronic bronchitis, small airways disease, and emphysema. Levels to which workers (e.g., miners, sandblasters) may be exposed can be carcinogenic. Silica exposure has been implicated in autoimmune diseases (rheumatoid arthritis, scleroderma, systemic lupus erythematosus) in gold miners and granite workers and in the causation of kidney disease in some occupations, possibly by an immune mechanism.

Acute exposures to high concentrations cause cough, shortness of breath, and pulmonary alveolar lipoproteinosis (acute silicosis). In a report on the hazards of exposure to crystalline silica, the American Thoracic Society (1997) stated, “Studies from many different work environments suggest that exposure to working environments contaminated by silica at dust levels that appear not to cause roentgenographically visible simple silicosis can cause chronic airflow limitation and/or mucus hypersecretion and/or pathologic emphysema.”

Other researchers also concluded that “chronic levels of silica dust that do not cause disabling silicosis may cause the development of chronic bronchitis, emphysema, and/or small airways disease that can lead to airflow obstruction, even in the absence of radiological silicosis.” Fibrotic lesions associated with crystalline silica have also been found at autopsy in the lungs of granite workers who lacked radiological evidence of silicosis.

Several studies have reported “environmental silicosis,” cases where the silicosis occurs in the absence of an industry usually associated with the disease. One study investigated non-occupational pneumoconiosis in Ladakh, India, high in the western Himalayas where there are no mines or industries. The prevalence of pneumoconiosis corresponded with the severity of dust storms and the presence or absence of chimneys in the kitchens (i.e., ventilated cooking). Without chimneys, dust concentrations in kitchens averaged 7.5 milligrams per meters cubed (mg/m^3) during cooking periods. The free silica content of the dust storms was approximately 60 percent to 70 percent. The authors suggested that exposure to free silica from dust storms and to soot from cooking with domestic fuels caused the pneumoconiosis. Such exposures in this and other studies might be considered to be non-industrial but occupational, since the subjects studied were involved in the domestic work of cleaning and cooking. Regardless, the exposures were very high and thus similar to some occupational exposures.

Regulatory Status of Crystalline Silica

Crystalline silica is widely used in industry and has long been recognized as a major occupational hazard, causing disability and deaths among workers in several industries. In 1997, the International Agency for Research on Cancer rated respirable crystalline silica a Class 1 carcinogen based exclusively on worker exposure levels and epidemiology. In 2005, the Office of Environmental Health Hazard Assessment (OEHHA) adopted the Toxicity Summary for respirable crystalline silica:

> "In 1997, IARC classified respirable crystalline silica in Class 1, a Known Human Carcinogen, based on occupational epidemiologic studies. However, chronic RELs are not based on cancer endpoints. Further, there is no approved cancer potency factor for silica."

In other words, adverse health effects or endpoints other than cancer were used by OEHHA to determine the chronic non-cancer reference exposure level (REL). For purposes of HRA using State of California AB 2588 Air Toxics Hot Spot Program methods, respirable crystalline silica is not a carcinogen. Concentrations to which the public may be exposed are unexpected to give rise to cancer. Accordingly, OEHHA developed the chronic, non-cancer REL. The California Occupational Health and Safety Administration (CalOSHA) developed the cancer protective permissible exposure level for worker exposures. Both OEHHA and CalOSHA thresholds are presented in Table 2.3-2, Regulatory Exposure Levels for Crystalline Silica.

2.3.3.2 San Diego Air Basin Attainment Designation

EPA and CARB classify air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant based on whether the NAAQS or CAAQS, respectively, have been achieved. These standards are set by EPA and CARB for the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable effects on human health or the public welfare. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as "attainment" for that pollutant. If an area exceeds the standard, the area is classified as "nonattainment" for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are redesignated as maintenance areas and must have approved maintenance plans to ensure continued attainment of the standards.

The criteria pollutants of primary concern that are considered in this analysis are O_3, NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$. Although there are no ambient standards for VOCs or NO_x, they are important as precursors to O_3 and, therefore, considered in this analysis.

The portion of the SDAB where the project Site is located is designated by EPA as an attainment (maintenance) area for the 1997 8-hour NAAQS for O_3, a nonattainment (marginal) area for the 2008 8-hour NAAQS for O_3, and a maintenance area for CO. The SDAB is designated in attainment for all other criteria pollutants under the NAAQS, with the exception of PM_{10}, which was determined to be unclassifiable.

The SDAB is currently designated nonattainment for O_3, PM_{10}, and $PM_{2.5}$ under the CAAQS. It is designated attainment for the CAAQS for CO, NO_2, SO_2, lead, and sulfates.

Table 2.3-3, San Diego Air Basin Attainment Classification, summarizes the SDAB's federal and state attainment designations for each of the criteria pollutants.

2.3.3.3 Air Quality Monitoring Data

The SDAPCD operates a network of ambient air monitoring stations throughout San Diego County, which measure ambient concentrations of pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The SDAPCD monitors air quality conditions at 10 locations throughout the basin.

Due to its proximity to the Site and similar geographic and climactic characteristics, the Escondido – East Valley Parkway monitoring station concentrations for all pollutants, except SO_2, are considered most representative of the project Site. The El Cajon – Redwood Avenue monitoring station is the nearest location to the project Site where SO_2 concentrations are monitored.

Ambient concentrations of pollutants from 2010 through 2014 are presented in Table 2.3-4, Ambient Air Quality Data. The number of days exceeding the NAAQS and CAAQS is shown in Table 2.3-5, Frequency of Air Quality Standard Violations. The federal 8-hour O_3 standards were exceeded in 2010, 2011, and 2014. The state 8-hour O_3 standards were exceeded every year from 2010 to 2014. The state 1-hour O_3 standards were exceeded in 2010, 2011 and 2014. The state 24-hour PM_{10} standard was exceeded in 2013, and the federal 24-hour $PM_{2.5}$ standard was exceeded in 2012 through 2014. Air quality within the project region was in compliance with both CAAQS and NAAQS for NO_2, CO, PM_{10} (NAAQS only), and SO_2 during this monitoring period.

2.3.4 Analysis of Project Effects and Determination as to Significance

2.3.4.1 Guidelines for the Determination of Significance

Guidelines to address the significance of air quality impacts are contained in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Based on those guidelines, a project would have a significant environmental impact if it would:

1. Conflict with or obstruct the implementation of the applicable air quality plan;
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for O_3 precursors);
4. Expose sensitive receptors to substantial pollutant concentrations; or
5. Create objectionable odors affecting a substantial number of people.

The following significance thresholds for air quality are based on criteria provided in the County's *Guidelines for Determining Significance – Air Quality* (County of San Diego 2007). The County's guidelines were adapted from Appendix G of the CEQA Guidelines listed above.

A significant impact would result if any of the following would occur:

- The project would conflict with or obstruct the implementation of the SDAPCD's RAQS and/or applicable portions of the SIP.
- The project would result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation:
  - The project would result in emissions that exceed 250 pounds per day of NO_x or 75 pounds per day of VOCs;
  - The project would result in emissions of CO that, when totaled with the ambient concentration, would exceed a 1-hour concentration of 20 ppm or an 8-hour average of 9 ppm;
  - The project would result in emissions of $PM_{2.5}$ that exceed 55 pounds per day;
  - The project would result in emissions of PM_{10} that exceed 100 pounds per day and increase the ambient PM_{10} concentrations by 5 micrograms per cubic meter ($\mu g/m^3$) or greater at the maximum exposed individual.

- The project would result in a cumulatively considerable net increase of any criteria pollutant for which the SDAB is in nonattainment under an applicable federal or state Ambient Air Quality Standard.
  - The following guidelines for determining significance must be used for determining whether the net increase during the construction phase is cumulatively considerable:
    - A project that has a significant direct impact on air quality with regard to construction-related emissions of PM_{10}, $PM_{2.5}$, NO_x, and/or VOCs would also have a significant cumulatively considerable net increase;
    - In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the construction-related emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines, including the SDAPCD's screening-level thresholds.
  - The following guidelines for determining significance must be used for determining whether the net increase during the operational phase is cumulatively considerable:
    - A project that does not conform to the SDPACD's RAQS and/or has a significant direct impact on air quality with regard to operational-related emissions of PM_{10}, $PM_{2.5}$, NO_x, and/or VOCs would also have a significant cumulatively considerable net increase;
    - Projects that cause road intersections to operate at or below level of service E (analysis required only when the addition of peak-hour trips from the proposed project and the surrounding projects exceeds 2,000) and create a CO hotspot create a cumulatively considerable net increase of CO.
    - In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the operational-related emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines, including the SDAPCD's screening-level thresholds.
- The project would expose sensitive receptors to substantial pollutant concentrations.
- The project places sensitive receptors near CO hotspots or creates CO hotspots near sensitive receptors;

- Project implementation would result in exposure to TACs resulting in a:
    - Maximum incremental cancer risk equal to or greater than 10 in one million, or
    - Cancer burden equal to or greater than 1.0, or
    - Total acute non-cancer health hazard index equal to or greater than 1.0, or
    - Total chronic non-cancer health hazard index equal to or greater than 1.0.
- The project, which is not an agricultural, commercial, or an industrial activity subject to SDAPCD standards, as a result of implementation, would either generate objectionable odors or place sensitive receptors next to existing objectionable odors, which would affect a considerable number of persons or the public.

San Diego Air Pollution Control District

As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 requiring the preparation of Air Quality Impact Assessments for permitted stationary sources. The SDAPCD sets forth quantitative emission thresholds below which a stationary source would not have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 2.3-6, SDAPCD Air Quality Significance Thresholds, are exceeded.

For CEQA purposes, the thresholds listed in Table 2.3-6 represent screening-level thresholds that can be used to evaluate whether project-related emissions could cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. In the event that emissions exceed these thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the CAAQS and NAAQS, including appropriate background levels. For nonattainment pollutants, if emissions exceed the thresholds shown in Table 2.3-6, the proposed project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

With respect to health risk, SDAPCD Rule 1210 implements the public notification and risk reduction requirements of state law, and requires stationary source facilities with a high potential to adversely impact public health to prepare HRAs and reduce health risks below specified significant risk levels. Additionally, SDAPCD's "Supplemental Guidelines for Submission of Air Toxics 'Hot Spots' Program Health Risk Assessments" address the modeling and methodological parameters of HRAs, noting a level of significance for public notification of 10 in 1 million for excess/incremental cancer risk and an index of 1.0 for noncancer-related acute and chronic health impacts from TACs corresponding to Rule 1210 (SDAPCD 2015b).

With respect to odors, SDAPCD Rule 51 (Public Nuisance) prohibits emissions of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

2.3.4.2 Construction Emissions Estimates and Methodology

Emissions from the construction phase of the proposed project were estimated using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1, available online (http://www.caleemod.com/), and EPA's *Compilation of Air Pollutant Emission* Factors (AP-42). Construction emissions can vary substantially from day to day, depending on the level of activity; the specific type of operation; and, for dust, the prevailing weather conditions. All overlapping construction activities and associated emissions, including those from general construction activities, blasting, and rock crushing, were accounted for in the quantification of maximum daily emissions.

Construction Equipment and Vehicle Trips

Construction is anticipated to commence in January 2018 and would require approximately 10 years to complete. The anticipated construction schedule and equipment fleet by phase is shown in Table 2.3-7. Additional details of the construction schedule including hours of operation and duration for heavy construction equipment; worker, vendor (delivery) and hauling trips; and equipment mix are included in Appendix A and Appendix B of the Air Quality Technical Report.

The equipment mix anticipated for construction activity was based on information provided by the applicant's representatives and best engineering judgment. The equipment mix is meant to represent a reasonably conservative estimate of construction activity. Default values for horsepower and load factor as provided in CalEEMod were used for the majority of construction equipment listed in Table 2.3-7; however, due to the large size of several off-highway trucks anticipated for the project during earthmoving activities, unit-specific horsepower was assigned to off-highway trucks during grading and earthmoving (Volvo A40 at 400 horsepower and CAT 777 at 1,000 horsepower). It was assumed all equipment used during each subphase would be operating 8 hours per day, 6 days per week.

The analysis of the Phase 1 improvements includes and addresses construction of the Caltrans I-15/Deer Springs Road interchange, which constitutes an offsite mitigation measure for the project. The Construction Phasing and Equipment List accounts for the construction equipment needed to implement these improvements, and the overall emissions estimates for the proposed project includes emissions from these pieces of equipment. Construction activities associated with the Caltrans project would be relatively short in duration and, subject to further review by Caltrans, not likely to exceed state thresholds for construction emissions. In any case, standard Caltrans measures can and should be used for the project to avoid or minimize temporary construction-related impacts to air quality.

All cut-and-fill quantities would be balanced within the boundaries of the project Site and the improvements to Deer Springs Road and Sarver Lane immediately off-Site, and no soil export or import would be required. Approximately 9.4 million cubic yards of cut and fill would occur during Phase 1, and approximately 1.3 million cubic yards of cut and fill would occur during Phase 2. A portion of this cut and fill material would be relocated on-site. Approximately 2,320,570 cubic yards of soil would be relocated on-site during Phase 1, and approximately 103,140 cubic yards of soil would be relocated on-site during Phase 2 (Fuscoe 2016) (see Table 2.3-8, Construction Grading and Excavation Quantities). To estimate emissions from trucks hauling excavated rock and soil to various portions of the project Site, daily haul truck quantities were estimated using the default hauling capacity of 16 cubic yards as designated in CalEEMod. Average travel distances were provided by Fuscoe based on internal site movement of soil for grading of individual neighborhoods.

All permanent roadway and roadway infrastructure improvements would be constructed in the early stages of Phase 1, which would serve to reduce construction-related vehicular travel on unpaved roads. However, conservatively, emissions have been estimated assuming that all on-site haul truck and vehicular travel during the entire construction period would occur on unpaved surfaces. This conservative assumption serves to overestimate construction-related fugitive dust emissions.

Architectural Coatings Methodology

VOC emissions generated from architectural coatings were estimated based on the number of single-family and multi-family dwelling units and square footage of retail space for each development phase, the calculation method in CalEEMod, and VOC content limitations per SDAPCD Rule 67.0.1 to determine the VOC emissions rate in pounds per day (see Appendix B of the Air Quality Technical Report).

Blasting Emissions Methodology

The estimated emissions of NO_x, CO, and SO_X from explosives used for on-site blasting were determined using emission factors in Section 13.3 (Explosives Detonation) of AP-42 (EPA 1980), and PM_{10} and $PM_{2.5}$ emissions were determined using Section 11.9 of AP-42 (EPA 1998). See Sections 3.1.2 and 4.2.1.2 of the Air Quality Technical Report for additional detail (Appendix G).

Rock Crushing Emissions Methodology

Excavated rock would be crushed and screened to produce capping material to be used in the construction of the proposed project. Much of this rock may be produced in the field using special attachments installed on off-road equipment used to excavate the rock. However, rock-crushing equipment may be installed to process the excavated rock. If so, this processing equipment would be the primary source of PM_{10} and $PM_{2.5}$ emissions.

The PM_{10} and $PM_{2.5}$ emissions from the processing equipment were calculated using factors provided in Section 11.9.2 of AP-42 (EPA 2004). See Sections 3.1.3 and 4.2.1.2 of the Air Quality Technical Report for additional detail (Appendix G).

Diesel Particulate Matter Health Risk Methodology

Proposed project construction would result in DPM emissions from heavy-duty construction equipment and trucks operating within the project Site. DPM is characterized as a TAC by CARB. The OEHHA has identified carcinogenic and chronic non-carcinogenic effects from long-term (chronic) exposure, but it has not identified health effects due to short-term (acute) exposure to DPM. The nearest existing off-site sensitive receptors consist of residences approximately 100 feet from the southeastern portion of the project Site. Additionally, since the proposed project also includes residential development that would be occupied in Phase 1 while Phase 2 of construction is on-going, impacts to on-site receptors were analyzed.

Cancer risk is defined as the increase in lifetime probability (chance) of an individual developing cancer due to exposure to a carcinogenic compound, typically expressed as the increased probability in 1 million people. The cancer risk from inhalation of a TAC is estimated by calculating the inhalation dose in units of milligrams/kilogram body weight per day based on an ambient concentration in units of micrograms per cubic meter ($\mu g/m^3$), breathing rate, age-specific sensitivity factors, and exposure period, and multiplying the dose by the inhalation cancer potency factor, expressed as units of inverse dose [i.e., (milligrams/kilogram body weight per day)$^{-1}$]. Typically, population-wide cancer risks are based on a lifetime (70 years) of continuous exposure and an individual resident cancer risk is based on a 30-year exposure duration; however, for the purposes of this analysis, a 10-year exposure scenario for off-site receptors corresponding to the worse-case construction period for the proposed project was assumed since construction activity would occur throughout the 1,985-acre project Site and would not be concentrated in any one area for the entire construction period of 10 years. A 7-year exposure scenario was assumed for potential on-site receptors, as the first residential occupancies would not occur until 2021 (Fuscoe 2016).

Cancer risks are typically calculated for all carcinogenic TACs and summed to calculate the overall increase in cancer risk to an individual. The calculation procedure assumes that cancer risk is proportional to concentrations at any level of exposure and that risks from various TACs are additive. This is considered a conservative assumption at low doses and is consistent with the updated OEHHA-recommended approach (OEHHA 2015).

Non-cancer health impact of an inhaled TAC is measured by the hazard quotient, which is the ratio of the ambient concentration of a TAC in units of $\mu g/m^3$ divided by the REL, also in units of $\mu g/m^3$. The inhalation REL is the concentration at or below which no adverse health effects are anticipated. The REL is typically based on health effects to a particular target organ system, such as the respiratory system, liver, or central nervous system. Hazard quotients are then summed for each target organ system to obtain a hazard index.

To estimate the ambient DPM concentrations resulting from construction activities at nearby sensitive receptors, a dispersion modeling analysis was performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) dispersion model (Lakes Environmental 2015), Version 15181, in conjunction with the Hotspots Analysis and Reporting Program Version 2 (HARP 2). CARB developed HARP 2 as a tool to implement the risk assessments and incorporates all the requirements provided by OEHHA as outlined in the *Air Toxics Hot Spot Program Risk Assessment Guidelines – Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015).

The cancer risk calculations were performed using the HARP 2 Risk Assessment Standalone Tool (RAST) by inputting the predicted annual DPM concentrations from AERMOD for the nearest potential on-site residence, which would be the Maximally Exposed Individual Resident, as well as for the nearest off-site resident.

In addition to the potential cancer risk, DPM has chronic (i.e., long-term) noncarcinogenic health impacts. The chronic hazard index was evaluated using the OEHHA inhalation RELs. The chronic noncarcinogenic inhalation hazard index for construction activities was also calculated using the HARP 2 RAST.

See Section 3.1.4 of the Air Quality Technical Report for additional detail (Appendix G).

2.3.4.3 Operational Emissions Estimates and Methodology

Criteria Pollutant Emission Estimates

Following the completion of construction activities, the proposed project would generate VOC, NO_x, CO, SO_X, PM_{10}, and $PM_{2.5}$ emissions from project land uses, as well as mobile and stationary sources including vehicular traffic from residents, space heating and cooling, water heating, and fireplace (hearth) use. Emissions from the operational phase of the proposed project were estimated using CalEEMod Version 2016.3.1 and the EPA's *Compilation of Air Pollutant Emission Factors* (AP-42).

The proposed project would impact air quality through the vehicular traffic generated by project residents. According to the project's Traffic Impact Analysis (see Appendix R to this EIR), total project-generated daily traffic is estimated to be 28,862 trips per day at full buildout (2028) with an average trip length of 10.21 miles per one-way trip (Appendix R). CalEEMod was used to estimate daily emissions from proposed vehicular sources (refer to Appendix B of the Air Quality Technical Report (Appendix G)). To account for project trips and vehicle miles travelled (VMT), the CalEEMod inputs included a total of 28,862 trips, including 100 percent primary trips at 10.21 miles per trip (Appendix R).

In addition to estimating mobile source emissions, CalEEMod was also used to estimate emissions from the stationary sources that would be located on the project Site, which include natural gas appliances, hearths, landscaping, and consumer products. CalEEMod default ratios for residential units with and without fireplaces were retained; however, it was assumed residential units with fireplaces would be natural gas and no wood-burning fireplaces or wood stoves would be installed. Similar to construction-related architectural coating emission estimates, VOC emissions generated from architectural coatings were estimated based on the number of single-family and multi-family dwelling units and square footage of retail space for each development phase, the calculation method in CalEEMod, and VOC content limitations per SDAPCD Rule 67.0.1 to determine the VOC emissions rate in pounds per day (see Appendix B of the Air Quality Technical Report (Appendix G)).

The estimation of proposed operational emissions is based upon typical residential, retail, commercial, educational and recreational uses, and the analysis is considered a conservative estimate of the project's anticipated emissions.

No operational emissions are anticipated as a result of the construction of off-site mitigation improvements at the I-15/Deer Springs Road interchange because: (i) the project would not increase the concentration of criteria pollutants that would result in air quality standard violations, (ii) the project would not violate standards for particulate matter of 2.5 micrometers or less ($PM_{2.5}$), and (iii) the project would not increase mobile source air toxics emissions as it is an improvement to an existing interchange.

Health Risk Assessment Modeling and Methodology

Three sources of TACs were included in the health risk analysis prepared for the proposed project: Interstate (I) 15, Deer Springs Road, and the ARCO gas station located immediately southeast of the project Site.

I-15 has more than 120,000 annual average daily trips and is located approximately 570 feet east of the nearest point of the proposed project's Town Center residences and school site. CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB Handbook) encourages consideration of the health impacts of freeways and high-volume roadways on sensitive receptors sited within 500 feet from the source in the land use decision-making process (CARB 2005). Although the residences located within the Town Center are located slightly more than 500 feet from I-15, impacts to these residences were analyzed (see Appendix).

Deer Springs Road has approximately 21,400 annual average daily trips and is located approximately 320 feet south of the Town Center's nearest point. The CARB Handbook identifies rural roadways with 50,000 vehicles per day or greater as high-volume roadways. Although Deer Springs Road currently does not experience 50,000 or more annual average daily trips, it is included in this analysis because it is located within 500 feet of Town Center and is the closest major roadway to the project Site. In addition to local roadways, an ARCO gas station is located approximately 100 feet southeast of the Town Center. For details regarding traffic projections and distribution, emissions associated with the gas station, and modeling methodology for health risk impacts, refer to the project's HRA (Appendix G).

2.3.5 Impact Analysis

2.3.5.1 Conformance to the Regional Air Quality Strategy

Guideline for the Determination of Significance

Based on Appendix G of the CEQA Guidelines, and the County's *Guidelines for Determining Significance – Air Quality*, the proposed project would have a significant impact if it would:

- Conflict with or obstruct the implementation of the RAQS and/or applicable portions of the State Implementation Plan (SIP).

Significance Prior to Mitigation

As previously discussed, the SDAPCD and SANDAG are responsible for developing and implementing the clean air plans for attainment and maintenance of the ambient air quality standards in the SDAB; specifically, the SIP and RAQS.[3] The federal O_3 maintenance plan, which is part of the SIP, was adopted in 2012. The SIP includes a demonstration that current strategies and tactics will maintain acceptable air quality in the SDAB based on the NAAQS. The RAQS was initially adopted in 1991 and is typically updated on a triennial basis (most recently in 2016). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The SIP and RAQS rely on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in San Diego County and the cities in the county, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by San Diego County and the cities in the County as part of the development of their general plans.

As mentioned above, the SIP and RAQS rely on SANDAG growth projections based on population, vehicle trends, and land use plans developed by the cities and by the County as part of the development of their general plans. As such, projects that involve development that is consistent with the growth anticipated by local plans would be consistent with the SIP and RAQS. However, if a project involves development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality.

The proposed project would include a General Plan Amendment that would allow a greater intensity of clustered development beyond current planned land uses. The Site lies within the Bonsall and North County Metropolitan Subregional Plan areas. The General Plan Land Use Element Regional Category for the proposed project is Rural Lands in Bonsall and Village, Semi-Rural and Rural Lands in the North County Metropolitan Subregional Plan areas. The General Plan Amendment proposes to amend the Regional Land Use Element Map to change the Regional Category Designation from Rural to Semi-Rural for a portion of the proposed project in the North County Metropolitan Subregional Plan area. The boundary and acreage of the Village area in the North County Metropolitan Subregional Plan area would remain unchanged. No changes in Regional Category are proposed for Bonsall.

The existing Community Plan Land Use Designations include General Commercial, Office-Professional, Semi-Rural 10 and Rural Lands 20. The proposed Community Plan Land Use Designations are Village Core Mixed Use, Semi-Rural 1 and 10, and Open Space Conservation.

[3] For the purpose of this discussion, the relevant federal air quality plan is the ozone maintenance plan (SDAPCD 2012). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the SDAB.

The existing zoning on the project Site General Commercial (C36), Office Professional (C30), Rural Residential (RR), Limited Agriculture (A70), Extractive (S82), and General Rural (S92). The proposed zoning would include General Commercial/Residential (C34), Urban Residential (RU), Limited Agriculture (A70), and Open Space (OS).

The County of San Diego's adopted General Plan emphasizes sustainable community design principles within its Goals and Policies. By locating the proposed project near existing and planned infrastructure, services, and jobs in a compact pattern of development, while at the same time promoting health and sustainability among its residents, the project has been designed around the guiding principles of the General Plan. Consistent with the County's Community Development Model, the most dense neighborhood on the Site, the Town Center, consists of a range of commercial uses that are supported by a dense network of local roads containing bicycle lanes and walkways linking the neighborhoods with parks, a proposed school site, and public areas. Spanning out from the Town Center, the proposed project's Semi-Rural areas would contain low-density residential neighborhoods. Further out, the neighborhoods would be surrounded by Rural Lands characterized by open space, habitat conservation, recreation, and other uses associated with rural areas.

Although the project would include sustainability features to reduce single-passenger vehicular trips and VMT, including features and measures described previously, the project would result in a more intense land use (the existing General Plan land use designations would allow for approximately 99 dwelling units and 2,008,116 square feet of commercial space) and would generate greater operational trips than those land uses currently allowed under the existing General Plan. As the proposed project would contribute to local population and employment growth and associated VMT that is not anticipated for the project Site in the existing General Plan, the proposed project is not accounted for in the SIP and RAQS, and the proposed project potentially would not be consistent with local air quality plans. The impact would be eliminated once the SDAPCD completes a future update to the RAQS, which would be based on updated SANDAG population and growth projections for the region. Mitigation measure M-AQ-1 is provided to ensure population growth and vehicle trips generated from the proposed project are provided to SANDAG for incorporation into the future RAQS update. This update will likely occur following project approval; therefore, at this time the impact is considered **potentially significant (AQ-1)**.

Mitigation Measures

M-AQ-1 Prior to SANDAG's next update to the Regional Housing Needs Assessment, the County of San Diego shall prepare a revised population, employment and housing forecast for SANDAG that reflects anticipated growth generated from the proposed project. The updated forecast provided to SANDAG shall be used to inform the SDAPCD update to the Regional Air Quality Strategy (RAQS) and

State Implementation Plan (SIP). The County of San Diego also shall prepare and submit a letter notifying the SDAPCD of this revised forecast for use in the future update to the RAQS and SIP as required.

Conclusions

Although coordination with SANDAG and the SDAPCD would be initiated, the proposed project would not be in conformance with the RAQS and SIP until population growth and associated trip generation is incorporated into the next update to the RAQS. It is unknown at this time when this update would occur, as the update is not within the control of the County of San Diego or the project applicant; therefore, impacts would remain **significant and unavoidable** following implementation of M-AQ-1.

2.3.5.2 Conformance to Federal and State Air Quality Standards

Construction Impacts

Guideline for the Determination of Significance

Based on Appendix G of the CEQA Guidelines, and the County's *Guidelines for Determining Significance – Air Quality*, the proposed project would have a significant impact if it would:

- Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Significance Prior to Mitigation

Construction Equipment and Vehicle Trips

Construction of the proposed project would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling soil and construction materials to the project Site. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Therefore, such emission levels can be approximately estimated, with a corresponding uncertainty in precise ambient air quality impacts. Fugitive dust emissions would primarily result from Site preparation and road construction activities. NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles.

As previously discussed, emissions from the construction phase of the proposed project were estimated using CalEEMod and AP-42.

Construction is anticipated to commence in January 2018 and would require approximately 10 years to complete. Phase 1 of the proposed project would occur from January 2018 to December 2024. Phase 1 of construction would include roadway improvements; construction of the northern and southern water tanks; and construction of the Hillside, Mesa, Lower Knolls, Valley and Terraces neighborhoods. Phase 2 of the proposed project would occur from December 2020 to November 2027. Phase 2 of construction would include improvements to Camino Mayor, construction of the Summit and Upper Knolls neighborhoods, and the Town Center. Details of the construction schedule including hours of operation and duration for heavy construction equipment; vendor, haul truck, and worker trips; and equipment mix are included in Appendix A of the Air Quality Technical Report (Appendix G).

The equipment mix anticipated for construction activity was based on information provided by the applicant's representative and best engineering judgment. The equipment mix is meant to represent a reasonably conservative estimate of construction activity. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least three times daily as necessary to comply with SDAPCD Rule 55, resulting in an approximately 61 percent reduction of particulate matter as calculated by CalEEMod.

The proposed project is also subject to SDAPCD Rule 67.0.1 – Architectural Coatings. This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories. Emissions as reported reflect reductions through compliance with SDAPCD Rule 67.0.1.

Blasting Emissions

Blasting would generate emissions of NO_x, CO, SO_X from the explosive and PM_{10} and $PM_{2.5}$ from fugitive dust generated by the blast. An estimated 17 to 19 tons of explosive would be used per day. Using the methodology described in Section 3.1.2 of the Air Quality Technical Report (Appendix G), the emissions of NO_x, CO, SO_X, PM_{10}, and $PM_{2.5}$ are presented in Table 2.3-9, Blasting Emissions. As noted in Section 3.1.2 of the Air Quality Technical Report (Appendix G), methane is the primary hydrocarbon reported, and methane is not considered to be VOC; thus, no VOC emissions are reported in Table 2.3-9. Detailed emissions calculations are provided in Appendix C of the Air Quality Technical Report (Appendix G).

Rock Crushing Emissions

Rock crushing equipment may be installed to provide capping material and other construction materials for roads and landscaping. The rock crushing emission estimates assume that the processing equipment would consist of a feed hopper into which blasted rock would be loaded using a large front-end loader, primary and secondary crushers, two screens to capture capping ("6 inch minus") and other construction materials, and several conveyors for inter-device transfers and stacking into stockpiles. The crushers, screens, and conveyors would be equipped with water sprays; thus, the AP-42 controlled emission factors were used, except for the emissions associated with loading the feed hopper. A maximum daily processing rate of 2,500 cubic yards or 5,650 tons per day per crushing facility was assumed for the emission calculations. It was assumed that 70 percent of the input to the primary crusher would pass along to the secondary crusher (Kruer 2015b) for further crushing. Rock-crushing equipment may be installed and operated depending on the phase.

Each diesel engine-generator to power the equipment is assumed to be rated at 750 kilowatts (or approximately 1,000 horsepower). It is assumed that each engine-generator would operate up to 8 hours per day. As discussed in Section 3.1.3 of the Air Quality Technical Report (Appendix G), the emission calculations were based on the CalEEMod emission factors for a typical off-road engine operating in 2018 (the first year of construction). It was assumed that the same engine-generators would be used for all three phases; thus, the CalEEMod emission factors for later years, which would generally be lower, were not applied. This serves to conservatively estimate project-related emissions.

The daily emissions by phase for the rock crushing operation and associated diesel engine-generators are shown by phase in Table 2.3-10. Emission calculations are provided in Appendix C of the Air Quality Technical Report (Appendix G).

As previously discussed, all cut-and-fill quantities would be balanced within the boundaries of the project Site and the improvements to Deer Springs Road and Sarver Lane immediately off-Site, and no soil export or import would be required. Fugitive dust from soil and excavated material truck loading were estimated using AP-42 emissions factors for drop operations. All grading activities, blasting, and rock crushing operations are anticipated to be completed by the end of 2022 when major earthwork activity would be completed for both phases; therefore, emissions generated after 2022 (2023–2027) would only result from general construction activities including building construction, utility work, paving, architectural coating, and landscaping. Additionally, due to the anticipated grading and earthwork schedule, it is anticipated that individual blasting or rock crushing activities during Phases 1 and 2 would occur sequentially and not overlap. See Appendix A and Appendix B of the Air Quality Technical Report (Appendix G) for construction schedule and additional details.

Table 2.3-11, Estimated Daily Maximum Construction Emissions – Unmitigated, shows the estimated maximum daily construction emissions associated with construction of the proposed project prior to implementation of mitigation measures. The maximum daily emissions for each pollutant may occur during different phases of construction; however, maximum daily emissions reflect the worst-case day accounting for overlapping construction subphases. It was conservatively assumed that maximum daily construction activities from overlapping construction phases, such as that resulting from Site preparation, grading, and building construction during Phases 1 and 2, could occur concurrently with blasting and rock crushing activities. Although these activities may occur on the same day, activities would occur in various locations across the project Site, which would vary on a daily basis. Therefore, maximum daily emissions shown in Table 2.3-11 reflect a conservative, worst-case construction scenario.

As shown, daily construction emissions would exceed the thresholds for VOC, NO_x, CO, PM_{10} and $PM_{2.5}$. Impacts for these pollutants would be **potentially significant (AQ-2)**. Daily construction emissions would not exceed the threshold for SO_X.

Mitigation Measures

Mitigation Measures M-AQ-2 through M-AQ-4 are provided to reduce VOC, NO_x, CO, PM_{10} and $PM_{2.5}$ emissions to the extent feasible.

M-AQ-2 Prior to the County of San Diego's approval of any construction-related permits, the project applicant or its designee shall place the following requirements on all plans, which shall be implemented during each construction phase to minimize VOC, CO and NO_x emissions:

a. Heavy-duty diesel-powered construction equipment shall be equipped with Tier 4 Final or better diesel engines, except where Tier 4 Final or better engines are not available for specific construction equipment. The County shall verify and approve all pieces within the construction fleet that would not meet Tier 4 Final standards;

b. Minimize simultaneous operation of multiple construction equipment units. During construction, vehicles in loading and unloading queues shall not idle for more than 5 minutes and shall turn their engines off when not in use to reduce vehicle emissions;

c. All construction equipment shall be properly tuned and maintained in accordance with manufacturer's specifications;

d. The use of electrical or natural gas-powered construction equipment shall be employed where feasible, including forklifts and other comparable equipment types;

e. Electrical hookups shall be provided on-site for the use of hand tools such as saws, drills, and compressors used for building construction to reduce the need for electric generators and other fuel-powered equipment;

f. A Construction Traffic Control Plan shall be developed to ensure construction traffic and equipment use is minimized to the extent practicable. The Construction Traffic Control Plan shall include measures to reduce the amount of large pieces of equipment operating simultaneously during peak construction periods, scheduling of vendor and haul truck trips to occur during non-peak hours, establish dedicated construction parking areas to encourage carpooling and efficiently accommodate construction vehicles, identify alternative routes to reduce traffic congestion during peak activities and increase construction employee carpooling.

A conceptual construction traffic control has been provided in Section 16 of the Traffic Impact Analysis (Appendix R), which includes specific construction traffic control measures. In addition to measures outlined in the Traffic Impact Analysis, the following measure shall be implemented to encourage employee carpooling:

The construction contractor shall implement a construction worker ridership program to encourage workers to carpool to and from the construction site to reduce single-occupancy vehicle trips. The construction manager will log all daily construction worker trips using the San Diego iCommute program (SANDAG 2015) (http://www.icommute.com/) or a comparable tracking method. The construction contractor shall notify all construction personnel of the program prior to the start of construction activities and shall notify construction personnel of the iCommute program RideMatcher feature, or similar communication method, to ensure personnel can identify available carpooling program participants. Trip data will be made readily available to County inspectors at the construction trailer on-site throughout the construction period.

M-AQ-3 Prior to the County of San Diego's approval of any grading permits and during project construction, a Fugitive Dust Plan shall be prepared demonstrating compliance with SDAPCD Rule 55 and County Code Section 87.428 (Grading Ordinance), to the satisfaction of the County. The project applicant or its designee shall require implementation of the following fugitive dust measures to minimize PM_{10} emissions as part of the Fugitive Dust Plan. All measures shall be designated on grading and improvement plans. Measure shall include but are not limited to:

a. Prior to construction activities, the project applicant shall employ a construction relations officer who will address community concerns regarding on-site construction activity. The applicant shall provide public notification in the form of a visible sign containing the contact information of the construction relations officer who will document complaints and concerns regarding on-site construction activity. The sign shall be placed in easily-accessible locations along Deer Springs Road and noted on grading and improvement plans;

b. Water, or use another SDAPCD-approved dust control, non-toxic agent, on the grading areas at least four times daily to minimize fugitive dust;

c. All permanent roads and roadway improvements shall be constructed and paved as early as possible in the construction process to reduce construction vehicle travel on unpaved roads. Building pads shall be finalized as soon as possible following Site preparation and grading activities to reduce fugitive dust from earth moving operations;

d. Stabilize grading areas as quickly as possible to minimize fugitive dust;

e. Apply chemical stabilizer, install a gravel pad, or pave the last 100 feet of internal travel path within the construction site prior to public road entry;

f. Wheel washers shall be installed adjacent to the apron indicated in (c) for tire inspection and washing prior to vehicle entry on public roads;

g. Remove any visible track-out into traveled public streets with the use of sweepers, water trucks or similar method within 30 minutes of occurrence;

h. Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads. Unpaved construction site egress points shall be graveled to prevent track-out;

i. Wet wash the construction access point at the end of the workday if any vehicle travel on unpaved surfaces has occurred;

j. Cover haul trucks or maintain at least 2 feet of freeboard to reduce blow-off during hauling;

k. Suspend all soil disturbance and travel on unpaved surfaces if winds exceed 25 miles per hour;

l. Cover on-site stockpiles of excavated material;

m. Enforce a 15-mile-per-hour speed limit on unpaved surfaces;

n. Pave permanent roads as quickly as possible to minimize dust;

o. Haul truck staging areas shall be provided for loading and unloading of soil and materials and shall be located away from sensitive receptors at the furthest feasible distance;

p. Construction Traffic Control Plans shall route delivery and haul trucks required during construction away from sensitive receptor locations and congested intersections to the extent feasible. Construction Traffic Control plans shall be finalized and approved prior to issuance of grading permits.

M-AQ-4 The following measure shall be included as part of the proposed project's Fugitive Dust Plan to reduce emissions associated with blasting and rock crushing activities:

a. During blasting activities, the construction contractor shall implement all feasible engineering controls to control fugitive dust including exhaust ventilation, blasting cabinets and enclosures, vacuum blasters, drapes, water curtains or wet blasting. Watering methods, such as water sprays and water applications shall be implemented during blasting, rock crushing, cutting, chipping, sawing, or any activity that would release dust particles to reduce fugitive dust emissions.

b. During rock crushing transfer and conveyance activities, material shall be watered prior to entering the crusher. Crushing activities shall not exceed an opacity limit of 20 percent (or Number 1 on the Ringelmann Chart) as averaged over a 3 minute period in any period of 60 consecutive minutes, in accordance with SDAPCD Rule 50, Visible Emissions. A qualified opacity observer shall monitor opacity from crushing activities once every 30 days while crushers are employed on-site to ensure compliance with SDAPCD Rule 50. Water sprayers, conveyor belt enclosures or other mechanisms shall be employed to reduce fugitive dust generated during transfer and conveyance of crush material.

Table 2.3-12, Estimated Daily Maximum Construction Emissions (pounds per day) – Mitigated, shows maximum daily emissions following implementation of M-AQ-2 through M-AQ-4. Not all elements of the mitigation measures are quantifiable; more specifically, Table 2.3-12 only reflects the emissions reductions attributable to the following mitigation elements: Site watering four times per day (M-AQ-3b), reduction of vehicle speeds on unpaved roads to 15 miles per hour (M-AQ-3m), and use of Tier 4 Final equipment (M-AQ-2a).

As shown, daily construction emissions would still exceed the thresholds for NO_x, CO, PM_{10}, and $PM_{2.5}$ following implementation of M-AQ-2 through M-AQ-4. Because not all reductions that would result from implementation of mitigation provided in M-AQ-2 through M-AQ-4 are quantifiable, the emissions totals shown in Table 2.3-12 are conservative, and emissions would be further reduced on a daily basis.

Further, upon completion of grading, blasting, and rock crushing activities, daily emissions from the remainder of construction (years 2023–2027) would be below the thresholds.

Nonetheless, based on the emissions total parameters illustrated in Table 2.3-12, impacts would remain **significant and unavoidable**.

While the final configuration and design of the Caltrans interchange improvements are not known at this time, to ensure potential impacts to air quality remain less than significant, this EIR recommends the following measure:

M-AQ-5 Pursuant to California Public Resources Code Section 21081(a)(2), in coordination with the I-15 interchange improvement project, which is within the responsibility and jurisdiction of Caltrans, Caltrans can and should require that project-appropriate measures for the proposed interchange project are implemented to avoid or minimize temporary construction-related impacts to air quality, such as compliance with Caltrans Standard Specifications 10-Dust Control and 18-Dust Palliative.

Conclusions

The emissions associated with project-related construction activities would be temporary. As shown in Table 2.3-11, daily construction emissions would exceed the thresholds for VOC, NO_x, CO, and PM_{10} and $PM_{2.5}$ prior to mitigation. Daily construction emissions would not exceed the threshold for SO_X. As shown in Table 2.3-12, following implementation of M-AQ-2 through M-AQ-4, VOC emissions would be reduced to a level that is less than significant; however, NO_x, CO, and PM_{10} and $PM_{2.5}$ emissions would remain **significant and unavoidable**.

Operational Impacts

Guideline for the Determination of Significance

Based on Appendix G of the CEQA Guidelines, and the County's *Guidelines for Determining Significance – Air Quality*, the proposed project would have a significant impact if it would:

- Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Significance Prior to Mitigation

Following the completion of construction activities, the proposed project would generate VOC, NO_x, CO, SO_X, PM_{10}, and $PM_{2.5}$ emissions from project land uses, as well as mobile and stationary sources including vehicular traffic from residents, space heating and cooling, water heating, and fireplace (hearth) use.

Table 2.3-13, Estimated Daily Maximum Operational Emissions, presents the maximum daily emissions associated with the operation of the proposed project after all phases of construction have been completed and the development is fully occupied in 2028. The values shown are the maximum summer and winter daily emissions results from CalEEMod. Project design features, including general design standards, transit planning principles, and non-motorized transportation features, have not been accounted for in the emissions estimates shown in Table 2.3-13. Complete details of the emissions calculations are provided in Appendix B of the Air Quality Technical Report (Appendix G).

As shown, daily operational emissions would not exceed the thresholds for NO_x and SO_x. Daily operational emissions would exceed the thresholds for VOCs, CO, PM_{10} and $PM_{2.5}$ and impacts for these pollutants would be **potentially significant (AQ-3)**.

Combined Construction and Operational Emissions

In addition to construction emissions associated with the Phase 1 and Phase 2 construction activities, residential units completed over the course of construction could become occupied while subsequent construction activities are on-going. In the event on-site units are occupied while construction activities continue in subsequent phases, operational emissions from completed development would occur simultaneously with on-site construction-related emissions. Phase 1 is anticipated to be completed in December 2024and would include the following neighborhoods: Sierra Hillside, Sierra Mesa, Sierra Knolls (Lower Knolls only), Sierra Valley and Sierra Terraces. Operation of Phase 1 would include approximately 774 single-family homes, 790 single-family clusters, and 325 age-qualified. Phase 2 would include operation of 101 single-family units; 145 single-family clusters; the Town Center, including 81,000 square feet of commercial retail space; and the school site. To estimate combined construction and operational emissions each year, phased development was evenly averaged over the buildout schedule for Phase 1 and Phase 2 and added to that year's construction emissions, beginning with the year 2021 when the first residential units could be occupied, as shown in Table 2.3-14.

As shown in Table 2.3-14, combined emissions construction and phased operational activities would exceed the thresholds for NO_x, CO and PM_{10} with blasting and rock crushing activities. Combined construction and operational emissions, without blasting and rock crushing activities, would only exceed the threshold for PM_{10}. Proposed project emissions would be **potentially significant** for these pollutants under the combined construction and operational emissions scenario.

Project Design Features and Mitigation Measures

As part of the project's Transportation Demand Management (TDM) Program, the project would employ project design features (PDFs) PDF- 1 through PDF-20 to reduce the number of vehicle trips generated by the proposed project including alternative modes of transportation. The TDM Program would facilitate increased opportunities for transit, bicycling, and pedestrian travel, as well as providing the resources, means, and incentives for ridesharing and carpooling opportunities to reduce the project's impacts on the surrounding street network while striving to achieve countywide air quality and GHG reduction goals. The TDM Program is organized into three main types of strategies, as outlined below.

Land Use Strategies

Land use strategies consist of land use diversity (mixed-use) and supporting design features that encourage residents/employees to walk, bike, or take transit within the project:

PDF-1 Provide a mix of land uses, including residential, commercial, educational, and parks, so that residents of the project have access to basic shopping, school, and recreation opportunities without having to travel outside of the project Site. This would lower vehicle miles traveled because residents can use alternative transportation modes to reach the various land uses available within the Site.

Commute/Travel Services for Residents

Commute and travel strategies would provide residents with travel options other than private automobile trips to destinations inside and outside of the project Site:

PDF-2 Develop a comprehensive trail network designed to provide multi-use trails between the various project components, land uses, parks/open spaces, school, and the Town Center. The trails network would provide connections to the various recreational trails and multi-modal facilities accessing the project Site. Additionally, the loop road includes 5-foot-wide bike lanes on both sides of the roadway.

PDF-3 Provide bicycle racks along main travel corridors, adjacent to commercial developments, at public parks and open spaces, and at retail and multi-family buildings within the project Site.

PDF-4 Implement an electric bike-share program to further link the project neighborhoods to one another and to reduce motorized vehicle trips. The bike share program includes the placement of eight kiosks throughout the Community. Electric bikes can be taken from one kiosk and left at another to promote sustainable transportation between planning areas. It is anticipated that each kiosk will contain

10 to 20 electric bikes.

PDF-5 Coordinate with a car-share organization to install three car-share stations with one car each (for a total of three cars) in the commercial area of the project Site, available to residents on an on-demand basis.

PDF-6 Coordinate a ride share or shuttle system that connects the various project neighborhoods to the Town Center and to external transit facilities and resources such as the park-and-ride lots and the Escondido Transit Center.

PDF-7 Coordinate with the San Diego Association of Governments (SANDAG) iCommute program for carpool, vanpool, and rideshare programs that are specific to the project's residents.

PDF-8 Promote the adjacent park-and-ride lots at the northeast quadrant of the Deer Springs Road/Mesa Rock Road intersection and at the northwest quadrant of the Deer Springs Road/Old Highway 395 intersection to residents to encourage carpooling.

PDF-9 Provide transit subsidies for residents.

PDF-10 Promote available websites providing transportation options for residents.

PDF-11 Create and distribute a "new resident" information packet addressing alternative modes of transportation.

PDF-12 Promote a transportation option app for use on mobile devices.

PDF-13 Coordinate with NCTD and SANDAG about future siting of transit stops/stations at the adjacent park-and-ride lots.

Commute Services for Employees

Commute strategies would allow employees at the Town Center and other employers within the project Site to travel to work by means other than private auto:

PDF-14 Provide transit subsidies for employees of the project's Town Center.

PDF-15 Promote available websites providing transportation options for businesses in the Town Center.

PDF-16 Promote the adjacent park-and-ride lots to employees to support carpooling.

PDF-17 Implement a demand-responsive shuttle service that provides access throughout the project Site, to the park-and-ride lots, and to the Escondido Transit Center.

PDF-18 Coordinate with SANDAG's iCommute program for carpool, vanpool, and rideshare programs that are specific to the project's employees.

PDF-19 Coordinate with NCTD and SANDAG on the future siting of transit stops/stations at the adjacent park-and-ride lots.

Transportation Coordinator

PDF-20 To ensure that the TDM Program strategies are implemented and effective, a transportation coordinator (likely as part of a homeowner’s association (HOA)) would be established to monitor the TDM Program, and would be responsible for developing, marketing, implementing, and evaluating the TDM Program.

In addition to the TDM Program outlined above, the following sustainability features would be implemented to reduce GHG emissions and improve energy and water conservation. These strategies have been incorporated into the project as PDFs.

PDF-21 Landform alteration shall be minimized by clustering development and preserving natural topography, open spaces, and view corridors. Community open space areas shall be integrated into Site design and building layout.

PDF-22 Solar panels shall be required on all residential units. Where feasible, roof-integrated solar panels should be considered to minimize visual impacts. All light fixtures along public roads shall be solar powered. The project can use centralized solar arrays (e.g., a solar array on top of a shade structure in a parking lot) to implement this requirement.

PDF-23 The garages of all single-family homes shall include an electric vehicle charger in the garage, and electric vehicle charging stations shall be installed in 3 percent of the Town Center’s commercial core parking spaces.

PDF-24 All common area landscapes shall meet an evapotranspiration adjustment factor of 0.55 within residential neighborhoods and 0.45 within non-residential areas. An evapotranspiration adjustment factor of 1.0 is allowed for special landscape areas (i.e., recreational and community garden areas), as noted in County Ordinance Number 10032. All irrigation shall be designed to meet or exceed an average irrigation efficiency rating of 0.75 for spray/rotor irrigation and 0.81 for drip irrigation.

PDF-25 Turf grass shall be prohibited in residential front yards and within street rights-of-way. Turf in rear or side yards of single-family homes shall be warm-season turf or shall have a plant species factor of 0.6 or lower.

PDF-26 All single-family homes shall be plumbed for greywater systems for use in private yards.

PDF-27 The amount of stormwater run-off and pollutant discharge shall be minimized through the use of open vegetated swales along roadways and within neighborhoods; water quality and detention basins; permeable paving, where feasible; and other similar low-impact-development techniques.

PDF-28 An area within the maintenance yard of the Sierra Farms Park shall be designated for collection of common area landscape trimmings. These landscape trimmings shall be chipped and ground into either mulch or compost and used to return organic matter and nutrients to the project's landscaped areas. The green waste collection area shall be designed to collect approximately 30 to 40 yards of material at a time (approximately three open stalls 10 feet wide by 10 feet long by 6 feet tall). A buffer of screening shrubs shall be planted between the collection area and the street. The green waste area shall be maintained by the HOA.

PDF-29 Vineyards and community gardens shall be incorporated to connect the Community to the region's agrarian history and provide productive landscapes.

PDF-30 Where feasible, commercial structures would use cool roof technologies and light-colored paving.

PDF-31 Builders would offer residents their choice of energy-efficient appliances (including washer/dryers, refrigerators), and appliances (including dishwashers) installed by builders would be Energy Star rated or equivalent.

PDF-32 The project would not install wood-burning fireplaces for heating purposes. All fireplaces would be natural-gas-fired.

In addition to project PDFs, mitigation measures M-AQ-6 through M-AQ-9 would be implemented to reduce impacts related to operational emissions:

M-AQ-6 Educational material shall be provided to all residents, commercial tenants, and school employees regarding alternative modes of transportation internal and external to the site, including information on the project-provided electric bike share program, shuttle services, bus routes, and other forms of alternative transportation. This information shall be made available in easily accessible areas in all commercial business spaces, school administrative offices, and residential lease offices on-site. This shall include the distribution of a "new resident" information packet addressing alternative modes of transportation.

M-AQ-7 Preferential parking shall be provided for electric-powered vehicles, compressed natural gas vehicles and carpool/vanpool rideshare programs.

M-AQ-8 The project applicant/phase developer shall develop a Green Cleaning Product education program to be made available at rental offices, leasing spaces, and/or on websites. The education program is intended for households and institutional consumers and consists of (1) provision of educational materials on low ROG/VOC consumer products; (2) educational materials addressing the use of detergents, cleaning compounds, polishes, floor finishes, cosmetics, personal care products, home, lawn and garden products, disinfectants, sanitizers, aerosol paints, automotive specialty products, low ROG/VOC paints and architectural coatings, and low-emissions landscape equipment; (3) educational materials on the importance of recycling and purchasing recycled material.

M-AQ-9 To minimize idling time and combustion of vehicle fuels, the project applicant or its designee shall ensure that any nonresidential building that uses large-scale refrigerated storage (e.g., restaurant, grocery store) equips each loading dock with an electrical hook-up to power refrigerated trucks.

M-AQ-10 To reduce air quality emissions, the project applicant (as defined above) shall implement the project design features listed above.

Emissions reductions from selected project design features of the TDM Program (PDF-1 through PDF-20) were accounted for through the 11.1 percent reduction in VMT, as more fully discussed in Sections 2.7, Greenhouse Gas Emissions, and 2.13, Transportation and Traffic. Emission reductions from PDF-21 through PDF-32 and M-AQ-6 through M-AQ-9 have not been accounted for in this analysis as these measures cannot be specifically quantified as to their reduction in criteria pollutant emissions.

Conclusions

As shown in Table 2.3-13, daily operational emissions would not exceed the thresholds for NO_x, and SO_X. Daily operational emissions would exceed the thresholds for VOCs, CO, PM_{10} and $PM_{2.5}$. The primary source of VOC emissions is the use of consumer products, which are subject to CARB regulations and could not be reduced further. The primary source of CO, PM_{10} and $PM_{2.5}$ is vehicular travel (CO emissions from exhaust and PM emissions from fugitive dust generated by vehicles traveling on paved roads); and these emissions cannot be feasibly mitigated further except to the extent that the project design features and recommended mitigation measures reduce VMT. Project design features and mitigation measures as described, including general design standards, transit planning principles, and non-motorized transportation features, would be implemented and would reduce operational emissions; however, significant reductions in VOC, CO, and PM_{10} and $PM_{2.5}$ emissions would be required to reduce emissions of these pollutants to levels that are less than significant, and feasible mitigation measures are not available to achieve these reductions. Following implementation of project design features listed above and M-AQ-6 through M-AQ-9, proposed project operational emissions would remain **significant and unavoidable**.

Additionally, as shown in Table 2.3-14, combined emissions from construction and operational activities would exceed the thresholds for NO_x, CO, and PM_{10} with blasting and rock crushing activities. Combined construction and operational emissions, without blasting and rock crushing activities, would only exceed the threshold for PM_{10}. Following implementation of M-AQ-2 through M-AQ-4, PDF-1 through PDF-32, and M-AQ-6 through M-AQ-9, proposed project construction and operational emissions would remain **significant and unavoidable** for NO_x, CO, and PM_{10} with blasting and rock crushing activities. Combined construction and operational emissions would remain **significant and unavoidable** for PM_{10} without blasting and rock crushing activities.

2.3.5.3 Impacts to Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. Air quality regulators typically define sensitive receptors as schools (preschool–12th grade), hospitals, resident care facilities, daycare centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. However, for the purposes of CEQA analysis in the County, the definition of a sensitive receptor also includes residents. The closest receptors to the proposed project include large-lot, single-family development to the north, west and south. South of the project Site is a mobile home park, the Golden Door Spa, and estate development along the border of the City of San Marcos and the unincorporated portion of the County.

The two primary emissions of concern regarding health effects for land development projects are DPM during construction and CO hotspots related to traffic congestion; however, emissions of other criteria air pollutants also result in health effects. Table 2.3-15 presents a list of the criteria pollutants and other related pollutants of concern, emission sources, associated health effects, and current SDAB attainment status.

Construction Impacts

Guidelines for the Determination of Significance

A significant impact would result if:

- Project implementation would result in CO emissions that, when totaled with the ambient concentrations, will exceed a 1-hour concentration of 20 ppm or an 8-hour average of 9 ppm. Projects have the potential to create CO concentrations exceeding the CAAQS if they

(i) cause road intersections to operate at or below a level of service E, and (ii) add more than 3,000 peak-hour trips in combination with the surrounding projects.

- Project implementation will result in exposure to TACs resulting in a::
- Maximum incremental cancer risks equal to or greater than 10 in one million, or
- Cancer burden equal to or greater than 1.0, or
- Total acute non-cancer health hazard index equal to or greater than 1.0, or
- Total chronic non-cancer health hazard index equal to or greater than 1.0.

Significance of Impacts Prior to Mitigation

Carbon Monoxide (CO) Hotspot

Mobile-source impacts occur essentially on two scales of motion. Regionally, project-related travel would add to regional trip generation and increase the VMT within the local airshed and the SDAB. Locally, project traffic would be added to the county roadway system in the vicinity of the proposed project. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, a potential for the formation of microscale CO "hotspots" occurs in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SDAB is steadily decreasing.

Carbon monoxide transport is extremely limited and disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations near a congested roadway or intersection may reach unhealthy levels, affecting sensitive receptors such as residents, school children, hospital patients, and the elderly. Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable level of service (LOS). Projects contributing to adverse traffic impacts may result in the formation of CO hotspots. Per County of San Diego guidelines, a CO hotspot analysis is only required to be conducted for the operational scenario per Section 3.2 of the guidelines (County of San Diego 2007). As indicated in the County of San Diego *Guidelines for Determining Significance and Report Format and Content Requirements Air Quality* (County of San Diego 2007), a site-specific CO hotspot analysis for project operations should be performed if a proposed development would cause road intersections to operate at or below a LOS E with intersection peak-hour trips exceeding 3,000. Although a CO hotspot analysis is not required for construction activities, the following analysis is provided for disclosure purposes.

Due to the phased nature of construction activities, it was assumed that no intersections in the vicinity of the project Site would exceed a peak-hour volume of 3,000 vehicles. Trip generation and distribution for workers and delivery trucks would ultimately vary depending on the phase of construction; however, based on daily construction worker, vendor trip and haul truck estimates, maximum daily trips resulting from construction activities would be approximately 812 trips per day (Fuscoe 2016), which would be well below the screening threshold of a *peak-hour* volume of 3,000 vehicles, and construction trips would occur throughout the day and would not all occur during the peak hour. No haul trucks associated with import or export of soil during grading would occur because all cut and fill activities would be balanced on-site.

The due diligence traffic assessment prepared for the project (Appendix R) analyzed existing, existing plus-project, and horizon year 2035 conditions at 33 intersections near the project site. The results of the operational LOS assessment show that under existing plus project plus cumulative conditions, eight of the 33 study intersections are forecast to operate at unacceptable level of service (LOS E or worse) during the peak hours. As shown in Appendix B, the eight key study intersections according to the criteria above: (1) Deer Springs Rd. and I-15 NB Ramps (LOS F in PM); (2) Deer Springs Rd. and I-15 SB Ramps (LOS E in AM and LOS F in PM); (3) Deer Springs Rd. and Twin Oaks Valley Rd. (LOS F in AM and PM); (4) Buena Creek Rd. and Twin Oaks Valley Rd. (LOS F in AM and PM); (5) Robelini Dr. and South Santa Fe Avenue (LOS F in AM); (6) Twin Oaks Valley Rd. and San Marcos Rd. (LOS F in PM); (7) Twin Oaks Valley Rd. and Discover Rd. (LOS E in AM and F in PM); and (8) Twin Oaks Valley Rd. and Richmar Ave. (LOS E in the PM). The remaining key intersections currently operate at an acceptable LOS during the AM and PM peak hours in both Near Term and Horizon scenarios with mitigation.

For each scenario (existing plus cumulative projects plus total project and horizon year plus total project), the screening evaluation presents LOS and whether a quantitative CO hotspots analysis may be required. According to the CO Protocol, there is a cap on the number of intersections that need to be analyzed for any one project. For a single project with multiple intersections, only the three intersections representing the worst LOS ratings of the project, and, to the extent they are different intersections, the three intersections representing the highest traffic volumes, need be analyzed. For each intersection failing a screening test as described in this protocol, an additional intersection should be analyzed (Caltrans 2010). All eight intersections were evaluated for CO Hotspots.

The emissions factor represents the weighted average emissions rate of the local San Diego County vehicle fleet expressed in grams per mile per vehicle. Consistent with the traffic scenario, emissions factors for 2020 were used for the intersections. Emissions factors were predicted by EMFAC2014 based on a 5-mile-per-hour (mph) average speed for all of the intersections for approach and departure segments. The hourly traffic volume anticipated to travel on each link, in units of vehicles per hour, was based on information provided by the traffic consultant and modeling assumptions are outlined in Appendix G.

Eight receptor locations were modeled at each intersection to determine CO ambient concentrations. Two receptors were assumed on the sidewalk at each corner of the modeled intersections, to represent the future possibility of extended outdoor exposure. CO concentrations were modeled at these locations to assess the maximum potential CO exposure that could occur in 2020. A receptor height of 5.9 feet (1.8 meters) was used in accordance with Caltrans recommendations for all receptor locations (Caltrans 1998b).

The SCAQMD guidance recommends using the highest 1-hour measurement in the last 3 years as the projected future 1-hour CO background concentration for the analysis. A CO concentration of 3.8 parts per million (ppm) was recorded in 2014 for the Escondido monitoring station in San Diego and was assumed in the CALINE4 model for 2020 (CARB 2016b). To estimate an 8-hour average CO concentration, a persistence factor of 0.70, as calculated based on the CO Protocol (Caltrans 2010), was applied to the output values of predicted concentrations in ppm at each of the receptor locations.

The results of the model are shown in Table 2.3-19, CALINE4 Predicted Carbon Monoxide Concentrations. Model input and output data are provided in Appendix G.

As shown in Table 2.3-19, the maximum CO concentration predicted for the 1-hour averaging period at the studied intersections would be 4.9 ppm, which is below the 1-hour CO CAAQS of 20 ppm (CARB 2016b). The maximum predicted 8-hour CO concentration of 3.43 ppm at the studied intersections would be below the 8-hour CO CAAQS of 9.0 ppm (CARB 2013). Neither the 1-hour nor 8-hour CAAQS would be equaled or exceeded at any of the intersections studied. Accordingly, the project would not cause or contribute to violations of the CAAQS and would not result in exposure of sensitive receptors to localized high concentrations of CO. As such, impacts would be less than significant to sensitive receptors with regard to potential CO hotspots resulting from project contribution to cumulative traffic-related air quality impacts, and no mitigation is required.

For these reasons, construction-related traffic is not expected to impact local intersections and cause an exceedance of the CO CAAQS. Impacts would be **less than significant.**

Toxic Air Contaminants – Diesel Particulate Matter

Project construction would result in emissions of DPM from heavy-duty construction equipment, engine-generators, and trucks operating on the project Site. As previously discussed, DPM is characterized as a TAC by CARB. The OEHHA has identified carcinogenic and chronic noncarcinogenic effects from long-term (chronic) exposure, but it has not identified health effects due to short-term (acute) exposure to DPM. Sensitive receptors in the project vicinity consist of scattered residences located at various locations near the project Site. The nearest sensitive receptors to the project Site are residences located approximately 100 feet (30 meters) from the southern section of the project Site. In addition to off-site receptors, on-site receptors that may occur following the completion of residential units in Phase 1 were analyzed. To analyze impacts to on-site receptors, a receptor grid was placed surrounding the 10-acre construction activity area to determine the maximally exposed individual. The maximum concentration, and thus, maximum impact, would occur approximately 33 feet (10 meters) from the construction volume sources.

DPM emissions reported in this analysis of impacts to on-site and off-site receptors is based on the use of Tier 4 Final equipment as required in mitigation measure M-AQ-2. Additionally, other T-BACT and CARB regulations would be applicable to the proposed project including Idling of Commercial Heavy Duty Truck (13 CCR Section 2485), In-Use Off-Road Diesel-Fueled Fleets (13 CCR Section 2449 et seq.), In-Use On-Road Diesel-Fueled Vehicles (13 CCR Section 2025) as described in Section 2.3.2, Regulatory Setting. Moreover, emission sources during construction would not remain in one location for an extended period of time, as equipment and trucks would continually move further away from receptors as construction is completed in any one specific area. Furthermore, at the time the first on-site residential units are occupied, the majority of on-site construction emissions exposure, if any, would primarily be generated from equipment associated with vertical (building) construction as opposed to extensive lateral grading activities. Vertical construction would likely take place within a smaller geographic space on-site. As a result, on-site impacts are likely overstated because the typical on-site receptor would not be located adjacent to construction activities and continually exposed to lateral construction activity over a 10-acre space for 7 years, as analyzed in this analysis.

DPM Concentrations

Cancer risk calculations were performed using the HARP 2 RAST by inputting the predicted annual DPM concentrations from AERMOD for the nearest potential on-site residence, which would be the Maximally Exposed Individual Resident, as well as for the nearest off-site resident. Cancer risk parameters, such as age sensitivity factors, daily breathing rates, fraction of time at home, and cancer potency factors were based on the values and data recommended by OEHHA (2015) as implemented in HARP 2. In addition to the potential cancer risk, DPM has chronic (i.e., long-term) noncarcinogenic health impacts. The chronic non-carcinogenic inhalation hazard index for construction activities was also calculated using the HARP 2 RAST. The results of the AERMOD and HARP modeling are provided in Appendix D of the Air Quality Technical Report (Appendix G). The modeled maximum annual concentrations at the maximally exposed future on-site resident (located about 10 meters from the volume sources) and existing off-site resident (located about 30 meters from the volumes sources) are shown in Table 2.3-16, Summary of DPM Concentrations.

Cancer Risk

Table 2.3-17, Summary of Maximum Cancer Risks – Construction DPM Emissions, shows the maximum modeled annual DPM concentrations for the maximally exposed future on-site resident and existing off-site resident and the maximum associated cancer risk.

The cancer risk at the Maximally Exposed Individual Resident on-site and off-site would not exceed the County significance threshold of 10 in 1 million for excess/incremental cancer risk. Impacts related to cancer risk during construction would be **less than significant**.

Chronic Hazard

Table 2.3-18, Summary of Maximum Chronic Hazard Indices – Construction DPM Emissions, shows the maximum modeled annual DPM concentrations for the maximally exposed future on-site resident and existing off-site resident and the associated risk.

The chronic hazard indices at these receptors shown in Table 2.3-18 would not exceed the County significance threshold of 1.0 for non-carcinogenic health impacts; therefore, impacts would be **less than significant**.

Although on-site and off-site cancer risk and chronic hazard impacts would be less than significant, mitigation measure M-AQ-10 has been provided to reduce impacts related to construction activity near sensitive receptors.

Crystalline Silica

Dust that is deposited near sensitive receptors is unlikely to result in exposure to respirable crystalline silica because the vast majority of deposited material is too large to be respirable. Moreover, there are no existing processes taking place or future processes that would take place as part of the proposed project at nearby receptor locations that would reduce the size of particles deposited making them smaller, respirable particles. Additionally, the small amount of respirable dust that may be deposited would need to be re-entrained into the air in order to be hazardous.

Long term exposure to ambient respirable crystalline silica concentrations greater than 3 µg/m3 causes silicosis and other adverse health effects. However, steady state air dispersion models that are normally used to evaluate project impacts are not well suited to predicting concentrations from blasting. Input data for other dispersion models that would produce meaningful results also are not feasible to obtain for the project.

The winds at the project Site are predominantly from the west-southwest; therefore, receptors located east of the project would be most affected by dust from blasting activities. It would take approximately 1 minute for a dust plume to pass by a receptor. The amount of dust inhaled would be limited by the brief exposure and the variability of blasting locations and would result in few repeat exposures that could produce a chronic effect from inhalation of blasting emissions.

Materials that would be blasted at the proposed project are granitic and similar to those blasted at hard rock quarries. The SCAQMD monitored respirable crystalline silica concentrations near the Azusa Rock Quarry and found that average concentrations were 0.5 $\mu g/m^3$ or six times less than the REL. This concentration included emissions from blasting and other construction emission sources on-site. Accordingly, concentrations that nearby receptors would be exposed to would be considered acceptable.

In summary, deposited crystalline silica is not considered to be a source of significant health risk and impacts would be **less than significant**. Although impacts would be less than significant, mitigation measure measures M-AQ-12 and M-AQ-12 would be implemented to control fugitive dust emissions generated during blasting activities.

Mitigation Measures

The following mitigation measure would be implemented to reduce impacts to sensitive receptors during construction.

M-AQ-11 Construction activities that would occur within 100 feet of an on-site or off-site residence shall be limited to 10 acres of disturbance per day.

M-AQ-12 During blasting activities, the construction contractor(s) shall implement all feasible engineering controls to control fugitive dust, including exhaust ventilation, blasting cabinets and enclosures, vacuum blasters, drapes, water curtains or wet blasting. Watering methods, such as water sprays and water applications shall be implemented during blasting, rock crushing, cutting, chipping, sawing, or any activity that would release dust particles to reduce fugitive dust emissions. Respirators and other personal protective equipment approved for protection against silica shall be issued to construction workers during blasting and rock crushing operations.

Conclusions

Impacts from CO, DPM, or crystalline silica would be less than significant during construction; therefore, impacts to sensitive receptors would be **less than significant**.

Operational Impacts

Guidelines for the Determination of Significance

A significant impact would result if:

- The project places sensitive receptors near CO hotspots or creates CO hotspots near sensitive receptors.
- Project implementation would result in exposure to TACs resulting in a:
    - Maximum incremental cancer risks equal to or greater than 10 in one million, or
    - Cancer burden equal to or greater than 1.0, or
    - Total acute noncancer health hazard index equal to or greater than 1.0, or
    - Total chronic noncancer health hazard index equal to or greater than 1.0.

Significance of Impacts Prior to Mitigation

Carbon Monoxide

Regarding the potential for CO hotspot impacts during operation, the project's traffic report evaluated nine intersections in the project vicinity to assess potential impacts resulting from the proposed project. The results of the traffic analysis show that the following eleven intersections are forecast to be LOS E or worse under existing-plus-project-plus-cumulative projects conditions:

- Deer Springs Road and I-15 northbound ramps
- Deer Springs Road and I-15 southbound ramps
- Deer Springs Road and Twin Oaks Valley Road
- Buena Creek Road and Twin Oaks Valley Road
- Robelini Drive and South Santa Fe Avenue
- Twin Oaks Valley Road and San Marcos Boulevard
- Twin Oaks Valley Road and Discover Road
- Twin Oaks Valley Road and Richmar Avenue

The results of the CO modeling analysis conducted for these eleven intersections are shown in Table 2.3-19, CALINE4 Predicted Carbon Monoxide Concentrations. Model input and output data are contained in Appendix F of the Air Quality Technical Report (Appendix G).

As shown in Table 2.3-19, maximum CO concentrations predicted for the 1-hour averaging period would be 4.9 ppm, which is below the state 1-hour CO standard of 20 ppm. Maximum predicted 8-hour CO concentrations of 3.43 ppm would be below the state CO standard of 9 ppm. As neither the state 1-hour standard nor the 8-hour standard would be equaled or exceeded at any of the intersections studied, potential CO hotspot impacts would be **less than significant**.

Toxic Air Contaminants

Cancer Risk

A HRA was prepared for the proposed project based on the most current guidance from OEHHA (Appendix G). Details regarding modeling methodology and health risk calculations are provided in the project's HRA (Appendix G).

OEHHA recommends that an exposure duration (residency time) of 30 years be used to estimate individual cancer risk for the Maximally Exposed Individual Resident, starting in the third trimester to accommodate the increased susceptibility of exposures in early life (OEHHA 2015, Appendix B, Table 8.5). Exposure durations of 9 years and 70 years are also recommended to be evaluated for the Maximally Exposed Individual Resident to show the range of cancer risk based on residency periods.

As analyzed, the school site (analyzed under a 9-year exposure scenario) would be exposed to a maximum cancer risk of approximately 4.2 in 1 million, and project residents located closest to I-15, under a 30-year exposure scenario, would be exposed to a maximum cancer risk of 26.4 in 1 million. The 70-year and 9-year cancer risk on project residents was estimated to be 31.1 and 18.8 in 1 million, respectively. As illustrated in Figure 2.3-1, Cancer Risk: 30-Year Exposure on Residential Receptor Locations, only residents located in the northeast and southeast corners of the Town Center residential area would be exposed to potentially significant cancer risk impacts (greater than 10 in 1 million) (Appendix G). Estimated cancer risk on other residential units would be below the threshold of significance.

In summary, the cancer risk at the proposed project's school site would not exceed the SDAPCD threshold of 10 in 1 million; however, the cancer risk in the northeast and southeast corners of the proposed project's Town Center residential area would exceed the SDAPCD significance thresholds and impacts would be **potentially significant (AQ-6)**.

Noncancer Health Impacts

In addition to the potential cancer risk, TACs in vehicle exhaust and gasoline fuels have chronic (i.e., long-term) and acute (i.e., short-term) noncancer health impacts. The chronic hazard indices were evaluated using the OEHHA and CARB RELs (CARB 2017). The REL is the concentration (inhalation) or daily dosage (noninhalation) at or below which no adverse health effects are anticipated. As analyzed in the project's HRA, the sensitive receptors (i.e., residents and school children) would be exposed to a maximum chronic hazard index of approximately 0.02 and acute hazard index of approximately 0.1, which are less than the SDAPCD threshold of 1.0 for chronic and acute noncancer health impacts. Impacts would be **less than significant**.

Cancer Burden

In addition to the thresholds for cancer risk and noncancer health hazard indices, cancer burden, for which a significance threshold of 1.0, is evaluated. Unlike cancer risk, which is the lifetime *probability* (chances) of an individual developing cancer due to exposure to a carcinogenic compound, cancer burden estimates the number of theoretical cancer *cases* in a defined population resulting from a lifetime exposure to carcinogenic TACs. As described in the OEHHA guidance manual:

> The cancer burden can be calculated by multiplying the cancer risk at a census block centroid by the number of people who live in the census block, and adding up the estimated number of potential cancer cases across the zone of impact. The result of this calculation is a single number that is intended to estimate of the number of potential cancer cases within the population that was exposed to the emissions for a lifetime (70 years) (OEHHA 2015).

In addition to more refined methods, the OEHHA guidance manual suggests a screening approach for estimating cancer burden. The screening method in the guidance manual is to "[c]alculate cancer burden by estimating the number of people in the [modeling] grid and stipulate that all are exposed at the highest level." This method is appropriate for use in the impact assessment because (a) the project site is currently uninhabited (i.e., no defined census blocks) and (b) the future population distribution over the project site is not precise. Furthermore, this method will provide a conservative estimate of cancer burden for the project's inhabitants (i.e., likely to overstate the impact).

Accordingly, for this project, the maximum estimated 70-year cancer risk over the project site was multiplied by the anticipated population of the project. As indicated in Section 1.8.1 of the Draft Environmental Impact Report, the project is anticipated to generate a total population of 6,063 new residents at buildout, based on the San Diego Association of Governments forecast for the North County Metropolitan Subregional area, which anticipates of 2.84 persons per household in 2020. Using the maximum estimated 70-year cancer risk over the project site of 31.1 in 1 million without implementation of mitigation measures and multiplying this value by the project population gives a cancer burden of 0.19. Accordingly, the cancer burden indicates that less than one person could contract cancer assuming a 70-year exposure under the modeled scenario of TAC emissions and provided that other factors related to an individual's susceptibility to contracting cancer would occur. Thus, the impact with respect to potential cancer cases for the project residents as a result of the proposed project would be **less than significant**.

Mitigation Measures

Consistent with SDAPCD guidance, mitigation measures were evaluated to identify ways to ensure that residents of the proposed project would not be exposed to health risks that exceed SDAPCD's significance thresholds and to ensure that impacts related to community risk and hazards from placement of sensitive receptors proximate to major sources of air pollution would be less than significant.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) reported that the Minimum Efficiency Reporting Value (MERV) 13 filters remove 90 percent of particles ranging from 1 to 3 microns, and less than 75 percent for particles ranging from 0.3 to 1 microns (ASHRAE 2007). ASHRAE reported that MERV 16 filters remove 95 percent of particles ranging from 0.3 to 1 microns and larger. In a study conducted by Fisk et al. on the performance and costs of particulate air filtration technologies, it was shown that if the ventilation systems are operated with one air exchange per hour of outside air and four air exchanges per hour of recirculated air: (i) MERV 13 (ASHRAE Dust Spot 85 percent) filters provide an 80 percent or greater reduction of outdoor fine particulate matter (such as diesel particulate matter); and (ii) MERV 16 (ASHRAE Dust Spot 95 percent) filters provide a 95 percent or greater reduction of outdoor fine particulate matter (Fisk et al. 2002). For this analysis, Dudek assumed a 95 percent particulate matter reduction for the air filters because substantial evidence supports that MERV 16 filters can provide a 95 percent or greater reduction of outdoor particulate matter (PM_{10}).

Studies also have shown that vegetative landscaping can reduce particulate emissions by up to 65 percent to 85 percent at lower wind speeds, with greater removal rates expected for ultra-fine particles <0.1 μm in diameter. The effectiveness of PM removal via tree plantings depends on characteristics of the species chosen (e.g., foliage surface, canopy structure, and life span) and varies by particulate size (Fujii et al. 2008; Fuller et al. 2009; SMAQMD 2011).

The following mitigation measures would reduce the significant impacts associated with cancer risk levels below the SDAPCD thresholds:

M-AQ-13 The applicant or its designee shall install high-efficiency return air filters on all heating, ventilation, and air conditioning (HVAC) system serving any residential unit located in the northeastern and southeastern portions of the Town Center that is identified as having a risk factor of 10 in 1 million or higher, as illustrated in Figure

2.3-1, Cancer Risk: 30-Year Exposure on Residential Receptor Locations. The air filtration system shall reduce at least 95 percent of particulate matter emissions, which can be achieved with a Minimum Efficiency Reporting Value 16 (MERV 16) air filtration system installed on return vents in residential units. The property management company for the homeowner's association (HOA) shall maintain the air filtration system on any HVAC system installed for the specified residential units in accordance with the manufacturer's recommendations for the life of the project.

M-AQ-14 The applicant or its designee shall locate air intake vents on the residential buildings having a risk factor of 10 in 1 million or higher, as illustrated in Figure 2.3-1, Cancer Risk: 30-Year Exposure on Residential Receptor Locations, such that they do not face Interstate 15 (I-15) and are as far from I-15 as practicable.

M-AQ-15 A County of San Diego–approved, ASHRAE-certified specialist shall verify the implementation of the installation of high-efficiency air filtration systems on return vents to reduce ambient particulate matter concentrations prior to occupancy of residential units having a risk factor of 10 in 1 million or higher, as illustrated in Figure 2.3-1, Cancer Risk: 30-Year Exposure on Residential Receptor Locations.

M-AQ-16 The applicant or its designee shall require the following measures be implemented into the final design of the residential units located in the northeastern and southeastern portions of the multi-family residential development area in the Town Center that is identified as having a risk factor of 10 in 1 million or higher, as illustrated in Figure 2.3-1, Cancer Risk: 30-Year Exposure on Residential Receptor Locations:

- Openable doors and windows shall be located on building faces that do not face Interstate 15. All windows facing Interstate 15 shall be fixed in place and not openable.
- No playgrounds, benches, or other passive or active activity areas shall be located in the risk-impacted northeastern and southeastern corners of the Town Center, in order to limit outdoor activities and exposure.

M-AQ-17 As part of landscape design and vegetation palette for the project, installation of tiered vegetative landscaping is encouraged, including the installation of evergreen trees between Interstate 15 and the Town Center residential units identified as having a risk factor of 10 in 1 million or higher, as illustrated in Figure 2.3-1, Cancer Risk: 30-Year Exposure on Residential Receptor Locations. Any vegetation selected shall be compatible with the project's Fire Protection

Plan. The tiered vegetation shall be maintained by the property management company for the homeowner's association (HOA) as part of the residential Community landscaping areas where feasible.

Implementing M-AQ-12 through M-AQ-16 would reduce the maximum cancer risks at the residential point of maximum impact to 9.1 in 1 million, which is below the threshold of significance. (Beneficial reductions in health risk impacts from the installation of tiered vegetative landscaping, as described in M-AQ-17, were not quantified because implementation of M-AQ-13 through M-AQ-16 mitigates health risk impacts to a level that is less than significant.)

Conclusions

Carbon Monoxide

Neither the state 1-hour standard nor the 8-hour standard would be equaled or exceeded at any of the intersections studied and potential CO hotspot impacts would be **less than significant**. No mitigation is required.

Toxic Air Contaminants

Students attending the on-site school would be exposed to a maximum cancer risk of approximately 4.2 in 1 million. Project residents located in the northeast and southeast corners of the Town Center residential area would be exposed to a maximum cancer risk of approximately 9.1 in 1 million upon implementation of M-AQ-13 through M-AQ-16 (Beneficial reductions in health risk impacts from the installation of tiered vegetative landscaping, as described in M-AQ-17, were not quantified because implementation of M-AQ-13 through M-AQ-16 mitigates health risk impacts to a level that is less than significant). Therefore, the cancer risks on the project Site would not exceed the SDAPCD threshold of 10 in 1 million for cancer impacts after mitigation.

The project residents would be exposed to maximum chronic and acute hazard indices of approximately 0.02 and 0.1, respectively. Therefore, the resulting maximum indices are less than the SDAPCD threshold of 1.0 for chronic and acute noncancer health impacts.

Assuming a 70-year exposure under the modeled scenario of TAC emissions, the analysis also determined that the project population would have a cancer burden of 0.19, which is less than the SDAPCD cancer burden threshold of 1.0.

With implementation of the recommended mitigation measures, the TAC-associated health impacts to on-site sensitive receptors would be **less than significant.**

2.3.5.4 Odor Impacts

Odors are a form of air pollution that can be obvious to the general public. Odors can present significant problems for both the source and surrounding area. Although offensive odors seldom cause physical harm, they can be annoying and cause concern.

Guidelines for the Determination of Significance

Based on Appendix G of the CEQA Guidelines, and the County's *Guidelines for Determining Significance – Air Quality*, the proposed project would have a significant impact if:

- The project, which is not an agricultural, commercial, or an industrial activity subject to SDAPCD standards, as a result of implementation, would either generate objectionable odors or place sensitive receptors next to existing objectionable odors, which would affect a considerable number of persons.

California Health and Safety Code Section 41700 and SDAPCD Rule 51, commonly referred to as public nuisance law, prohibit emissions from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property. The potential for an operation to result in odor complaints from a "considerable" number of persons in the area would be considered to be a significant, adverse odor impact.

Projects required to obtain permits from SDAPCD are evaluated by SDAPCD staff for potential odor nuisance, and conditions may be applied (or control equipment required) where necessary to prevent occurrence of public nuisance.

Odor issues are very subjective by the nature of odors themselves and due to the fact that their measurements are difficult to quantify. As a result, this guideline is qualitative, and each project would be reviewed on an individual basis, focusing on the existing and potential surrounding uses and location of sensitive receptors.

Significance of Impacts Prior to Mitigation

Construction

Section 6318 of the San Diego County Zoning Ordinance requires that all commercial and industrial uses be operated so as not to emit matter causing unpleasant odors that are perceptible by the average person at or beyond any lot line of the lot containing said uses. Section 6318 goes on to further provide specific dilution standards that must be met "at or beyond any lot line of the lot containing the uses" (County of San Diego 1979). SDAPCD Rule 51 (Public Nuisance) also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A proposed project that involves a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

The closest receptors to the proposed project include large-lot, single-family development to the north, west, and south. South of the project Site is a mobile home park, Golden Door Spa, and estate development along the border of the City of San Marcos and the unincorporated portion of the County.

Construction of proposed project components would result in emissions of diesel fumes and other odors typically associated with construction activities. These compounds would be emitted in varying amounts on the project Site depending on where construction activities are occurring. Sensitive receptors located in the vicinity of the construction Site may be affected. Odors are highest near the source and would quickly dissipate off-site. Any odors associated with construction activities would be temporary and would cease upon project completion; therefore, odor impacts would be considered **less than significant.**

Operations

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project would include equestrian facilities and trails that could generate potential odors, as well as a homeowners association (HOA) maintained green waste collection area within the HOA maintenance yard of the Sierra Farms Park. The green waste collection area is for landscape trimmings from common area landscapes to be chipped and ground into mulch or compost for reuse in common landscape areas. This area would be designed to collect approximately 30 to 40 yards of material at a time (approximately three open stalls 10’ wide x 10’ long x 6’ tall) and would be buffered with screening shrubs.

Section 4.1 of the project’s Vector Management Plan includes measures related to nuisance odors associated with equestrian uses (Appendix M). Measures include cleaning of corrals, waste management and disposal, cleaning of water troughs, and general sanitation management. Additionally, the proposed project would be required to comply with the odor policies enforced by SDAPCD, including Rule 51 in the event a nuisance complaint occurs, and County Code Sections 63.401 and 63.402, which prohibit nuisance odors and identify enforcement measures to reduce odor impacts to nearby receptors. As such, proposed residential, commercial and educational uses would not generate objectionable odors off-site. Thus, the impacts associated with odors would be **less than significant.**

Mitigation Measures

No mitigation measures or design considerations would be required.

Conclusions

Section 4.1 of the project's Vector Management Plan includes measures related to nuisance odors associated with equestrian uses (Appendix M). Additionally, the proposed project would be required to comply with the odor policies enforced by SDAPCD, including Rule 51 in the event a nuisance complaint occurs, and County Code Sections 63.401 and 63.402, which prohibit nuisance odors and identify enforcement measures to reduce odor impacts to nearby receptors. Therefore, impacts associated with objectionable odors would be **less than significant**.

2.3.6 Cumulative Impact Analysis

In analyzing cumulative impacts from a proposed project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the SDAB is listed as nonattainment for the state and federal ambient air quality standards. The proposed project would have a cumulatively considerable impact if project-generated emissions would exceed thresholds for PM_{10}, $PM_{2.5}$, NO_x, and/or VOCs. If the proposed project does not exceed thresholds and is determined to have less-than-significant project-specific impacts, it may still have a cumulatively considerable impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, the proposed project would be considered to have a cumulative impact only if the proposed project's contribution accounts for a significant proportion of the cumulative emissions.

Geographic Extent

The geographic extent for the analysis of cumulative impacts related to air quality includes the north-central corner of the SDAB (San Diego County). Due to the nonattainment status of the SDAB, the primary air pollutants of concern would be NO_x and VOCs, which are ozone precursors, and PM_{10} and $PM_{2.5}$. Project-related NO_x and VOCs are primarily emitted from motor vehicles and construction equipment, and PM_{10} and $PM_{2.5}$ are emitted primarily as fugitive dust during construction. Because of the nature of ozone as a regional air pollutant, emissions from the entire geographic area for this cumulative impact analysis would tend to be important, although maximum ozone impacts generally occur downwind of the area in which the ozone precursors are released. PM_{10} and $PM_{2.5}$ impacts, on the other hand, would tend to occur locally; thus, projects occurring in the same general area and in the same time period would tend to create cumulative air quality impacts.

Existing Cumulative Conditions

Air quality management in the geographic area for the cumulative impact assessment is the responsibility of the SDAPCD. Existing levels of development in the County have led to the nonattainment status for ozone with respect to the CAAQS and NAAQS, and for PM_{10} and $PM_{2.5}$ with respect to the CAAQS. The nonattainment status is based on ambient air quality monitoring generally conducted in the urban portions of the County.

Due to its proximity to the Site and similar geographic and climactic characteristics, the Escondido – East Valley Parkway monitoring station monitors concentrations for criteria pollutants near the project Site. Background ambient air quality, as measured at the monitoring stations maintained and operated by SDAPCD, measures the concentrations of pollutants from existing sources; therefore, past and present project impacts are included in the background ambient air quality data.

The air quality plans prepared by the SDAPCD reflect future growth under local development plans, but they are intended to reduce emissions countywide to levels that would comply with the NAAQS and CAAQS through implementation of new regulations at the local, state, and federal levels.

The separate guidelines of significance discussed below have been developed to respond to the following question from the CEQA Guidelines Appendix G:

- The project would result in a cumulatively considerable net increase of any criteria pollutant for which the SDAB is nonattainment under an applicable federal or state ambient air quality standard (including emissions that exceed the significance thresholds for O_3 precursors listed in Table 2.3-3).

Construction Impacts

Guidelines for the Determination of Significance

Cumulatively considerable net increases during the construction phase would typically occur if two or more projects near each other are simultaneously under construction. The following guidelines for determining significance must be used for determining whether the net increase during the construction phase is cumulatively considerable:

- A project that has a significant direct impact on air quality with regard to construction-related emissions of PM_{10}, $PM_{2.5}$, NO_x, and/or VOCs would also have a significant cumulatively considerable net increase.
- In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the construction-

related emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines identified in Table 2.3-1.

Significance of Impacts Prior to Mitigation

In analyzing cumulative impacts from the proposed project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the SDAB is designated as nonattainment for the CAAQS and NAAQS. If the proposed project's emissions do not exceed thresholds and the project is determined to have less-than-significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the proposed project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds.

The SDAB has been designated as a federal nonattainment area for O_3 and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB.

Construction of cumulative projects simultaneously with the proposed project would result in a temporary addition of pollutants to the local airshed caused by soil disturbance and hauling activities, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials and worker vehicular trips. Fugitive dust (PM_{10} and $PM_{2.5}$) emissions would primarily result from Site preparation activities. NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles, the latter of which would generally be dispersed over a large area where the vehicles are traveling.

As discussed previously, temporary unmitigated emissions of VOC, NO_x, CO, and PM_{10} and $PM_{2.5}$ would exceed the significance thresholds during construction. The proposed project would be required to comply with SDAPCD Rule 55, which regulates construction activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive disturbed areas, as well as trackout and carryout onto paved roads beyond a project Site. Additionally, construction would be short-term and temporary in nature. Once construction is completed, construction-related emissions would cease. However, it is possible that other land development and infrastructure projects could be constructed in the general vicinity and during the same time frame as the proposed project.

To reduce VOC, CO and NO_x emissions from construction activities, M-AQ-2 would be implemented. Following implementation of M-AQ-2, emissions would not be reduced to a level below the thresholds for CO and NO_x emissions. As such, effects regarding NO_x and CO emissions during construction activities would be significant and unavoidable. M-AQ-3 and M-AQ-4 would be implemented to reduce fugitive dust emissions; however, following implementation of M-AQ-3 and M-AQ-4, fugitive dust emissions would remain above the threshold. PM_{10} impacts would be significant and unavoidable during grading, blasting and rock crushing activities. Following completion of grading, blasting and rock crushing, fugitive dust emissions would be below the thresholds of significance.

Should other projects occur in the vicinity of the proposed project, significant effects related to NO_x, CO, PM_{10} and $PM_{2.5}$ emissions would be further intensified due to multiple sites with potential earthmoving activities associated with Site preparation and grading (resulting in increased PM_{10} and $PM_{2.5}$ emissions), and exhaust emissions from construction equipment, worker vehicles (resulting in increased NO_x and CO emissions) and truck trips associated with material deliveries and on-site hauling activities. Significant off-site VOC emissions would likely result during project construction when combined with other reasonable foreseeable future projects, primarily due to overlapping application of architectural coatings during construction. Due to the likelihood of a large number of off-site worker vehicle and truck trips required during construction of combined future projects in the cumulative study area, no feasible mitigation would be available to reduce cumulative effects for these criteria pollutants. Therefore, the proposed project's temporary cumulative construction effects relative to NO_x, CO, PM_{10} and $PM_{2.5}$ emissions would be **significant and unavoidable** following project-specific mitigation when considered in combination with reasonably foreseeable future projects under the cumulative scenario.

Mitigation Measures

M-AQ-2 through M-AQ-4 are provided to reduce construction-related impacts to criteria pollutant emissions.

Conclusions

The emissions associated with construction would be temporary, lasting approximately 10 years. As shown in Table 2.3-11, daily construction emissions would exceed the thresholds for VOC, NO_x, CO, and PM_{10} and $PM_{2.5}$ prior to mitigation. Unmitigated daily construction emissions would not exceed the threshold for SO_X. As shown in Table 12, emissions would still exceed the thresholds for NO_x, CO, PM_{10}, and $PM_{2.5}$ following implementation of mitigation measures M-AQ-2 through M-AQ-4. Additionally, as shown in Table 14, combined Phase 1 operational and Phase 2 construction emissions would exceed the thresholds for NO_x, CO and PM_{10} with blasting and rock crushing activities. Combined construction and operational emissions would only exceed the thresholds for PM_{10} without blasting and rock crushing activities. Moreover, because other cumulative projects would have the potential to be constructed in the project vicinity, cumulative construction emissions could further exacerbate emissions shown in Tables 11, Table 12 and 14. Following implementation of M-AQ-2 through M-AQ-4, cumulative construction emissions would remain **significant and unavoidable.**

Operational Impacts

Guidelines for the Determination of Significance

The guidelines for the consideration of operational cumulatively considerable net increases are treated differently due to the mobile nature of the emissions. The SDAB's RAQS, based on growth projections derived from the allowed general plan densities, is typically updated every 3 years by SDAPCD and lays out the programs for attaining the CAAQS for O_3 precursors. It is assumed that if a project that conforms to the County General Plan and does not have emissions exceeding the screening-level thresholds, it would not create a cumulatively considerable net increase for O_3 since the emissions of O_3 precursors were accounted for in the RAQS.

The following guidelines for determining significance must be used for determining whether the net increase during the operational phase is cumulatively considerable:

- A project that does not conform to the SDAPCD's RAQS and/or has a significant direct impact on air quality with regard to operational-related emissions of PM_{10}, $PM_{2.5}$, NO_x, and/or VOCs would also have a significant cumulatively considerable net increase.
- Projects that cause road intersections to operate at or below a level of service E (analysis only required when the addition of peak-hour trips from the proposed project and the surrounding projects exceeds 2,000) and create a CO hotspot create a cumulatively considerable net increase of CO.
- In the event that direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the operational-related emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines identified in Table 2.3-1.

Significance of Impacts Prior to Mitigation

With regard to cumulative impacts associated with O_3 precursors, in general, if a project is consistent with the community plan and general plan, it has been accounted for in the O_3 attainment demonstration contained within the RAQS. As such, it would not cause a cumulatively significant impact on the ambient air quality for O_3.

As previously discussed, the project proposes to amend the General Plan, Community Plan, and zoning to allow a greater intensity of clustered development beyond current planned land uses. As the proposed project would contribute to local population and employment growth and associated VMT that is not anticipated for the project Site by the General Plan, the proposed project is not considered accounted for in the RAQS, and the proposed project would result in cumulatively considerable impacts.

Additionally, as shown in Table 2.3-13, the proposed project would exceed operational criteria pollutant emission thresholds, thereby resulting in direct impacts to VOCs, CO, and PM_{10} and $PM_{2.5}$. Therefore, when combined with potential future projects, operational cumulative emissions would be considered **potentially significant**.

Project Design Features and Mitigation Measures

PDF-1 through PDF- 32 would be implemented to reduce operational emissions. The PDFs include general design standards, transit planning principles, and non-motorized transportation features. Additionally, M-AQ-6 through M-AQ-9 would be implemented to further reduce operational emissions.

Conclusions

Even with implementation of PDF-1 through PDF-32 and M-AQ-6 through M-AQ-9, significant reductions in VOCs, CO, PM_{10} and $PM_{2.5}$ emissions would be required to reduce emissions of these pollutants to less than significant and feasible mitigation measures are not available to achieve these reductions. When considered with other potential cumulative projects in the proposed project vicinity, cumulative operational emissions would be considered **significant and unavoidable**.

Additionally, although coordination with SANDAG and the SDAPCD would be initiated, the proposed project would not be in conformance with the RAQS and SIP until population growth and associated trip generation is incorporated into the next update to the RAQS. It is unknown at this time when this update would occur, as the update is not within the control of the County of San Diego or the project applicant; therefore, impacts would remain **significant and unavoidable** following implementation of M-AQ-1.

Table 2.3-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	National Standards[2]	
		Concentration[3]	*Primary*[3,4]	*Secondary*[3,5]
O_3	1-hour	0.09 ppm (180 μg/m^3)	—	Same as Primary Standard
	8-hour	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)	
CO	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
NO_2[6]	1-hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	
SO_2[7]	1-hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)	—
	3-hour	—	—	0.5 ppm (1300 μg/m^3)
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas)[7]	
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas)[7]	—
PM_{10}[8]	24-hour	50 μg/m^3	150 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m^3	—	
$PM_{2.5}$[8]	24-hour	—	35 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m^3	12.0 μg/m^3	15.0 μg/m^3
Lead[9,10]	30-day Average	1.5 μg/m^3	—	—
	Calendar Quarter	—	1.5 μg/m^3 (for certain areas)[10]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 μg/m^3	
Hydrogen sulfide	1-hour	0.03 ppm (42 μg/m^3)	—	—
Vinyl chloride[9]	24-hour	0.01 ppm (26 μg/m^3)	—	—
Sulfates	24-hour	25 μg/m3	—	—
Visibility reducing particles[11]	8-hour (10:00 a.m. to 6:00 p.m. PST)	See footnote 11	—	—

Source: [1] EPA 2014a, [2] CARB 2016

ppm= parts per million by volume; μg/m^3 = micrograms per cubic meter; mg/m^3= milligrams per cubic meter.

1 California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, 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.

2 National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For NO_2 and SO_2, the standard is attained when the 3-year average of the 98th and 99th percentile, respectively, of the daily maximum 1-hour average at each monitor within an area does not exceed 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 μg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

3 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.

4 Any equivalent measurement method 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.

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

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

7 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.

8 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

9 On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12.0 μg/m^3 . The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM10 standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

10 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 1-hour standard is in units of parts per billion (ppb). California standards are in units of 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 is identical to 0.100 ppm.

11 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 1 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.

12 CARB 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.

13 The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 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.

14 In 1989, CARB 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

Table 2.3-2
Regulatory Exposure Levels for Crystalline Silica

Agency	Applicability	Concentration (μg/m^3)	Basis
OEHHA	Environmental exposures to respirable dust.	3	Non-cancer health effect, annual average exposure.
CalOSHA	Worker exposures to respirable dust.	50	Carcinogenic health effect. 8 hour time weighted average exposure.

Source: Appendix G.

Table 2.3-3
SDAB Attainment Classification

Pollutant	Federal Designation[a]	State Designation[b]
O_3 (1-hour)	Attainment[1]	**Nonattainment**
O_3 (8-hour – 1997) (8-hour – 2008)	Attainment (Maintenance) **Nonattainment (Marginal)**	**Nonattainment**
CO	Attainment (Maintenance)[2]	Attainment
PM_{10}	Unclassifiable/Attainment[3]	**Nonattainment**
$PM_{2.5}$	Unclassifiable/Attainment	**Nonattainment**
NO_2	Unclassifiable/Attainment	Attainment
SO_2	Attainment	Attainment
Lead[4]	Unclassifiable/Attainment	Attainment
Sulfates	(no federal standard)	Attainment
Hydrogen Sulfide	(no federal standard)	Unclassified
Visibility-Reducing Particles	(no federal standard)	Unclassified
Vinyl chloride[4]	No federal standard	No designation

Sources: [a] EPA 2015; [b] CARB 2014a.

1 The federal 1-hour standard of 0.12 ppm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in SIPs.

2 The western and central portions of the SDAB are designated attainment, while the eastern portion is designated unclassifiable/attainment.

3 At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

4 CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined.

Table 2.3-4
Ambient Air Quality Data

Pollutant	Averaging Time	2010	2011	2012	2013	2014	Most Stringent Ambient Air Quality Standard	Monitoring Station
O_3	8-hour	0.084	0.089	0.074	0.075	0.079	0.070 ppm	Escondido – East Valley Parkway
	1-hour	0.105	0.098	0.084	0.084	0.099	0.090 ppm	
PM_{10}	Annual	21.0 μg/m^3	18.8 μg/m^3	18.1 μg/m^3	23.1 μg/m^3	21.5 μg/m^3	20 μg/m^3	Escondido – East Valley Parkway
	24-hour	43.0 μg/m^3	40.0 μg/m^3	33.0 μg/m^3	82.0 μg/m^3	44.0 μg/m^3	50 μg/m^3	
$PM_{2.5}$	Annual	12.2 μg/m^3	10.4 μg/m^3	10.8 μg/m^3	10.5 μg/m^3	9.6 μg/m^3	12 μg/m^3	Escondido – East Valley Parkway
	24-hour	52.2 μg/m^3	27.4 μg/m^3	70.7 μg/m^3	56.3 μg/m^3	82.3 μg/m^3	35 μg/m^3	
NO_2	Annual	0.014	0.013	0.013	0.013	0.011	0.030 ppm	Escondido – East Valley Parkway
	1-hour	0.064	0.062	0.062	0.061	0.063	0.180 ppm	
CO	8-hour	2.46	2.30	3.70	n/a	n/a	9.0 ppm	Escondido – East Valley Parkway
	1-hour*	3.90	3.50	4.40	n/a	n/a	20 ppm	
SO_2	Annual	n/a	0.00	n/a	n/a	n/a	0.030 ppm	El Cajon – Redwood Avenue
	24-hour	n/a	0.001	0.001	n/a	n/a	0.040 ppm	

Sources: CARB 2014b; EPA 2014c.
Data represent maximum values
NA = data not available/insufficient data
* Data were taken from EPA 2014c.

Table 2.3-5
Frequency of Air Quality Standard Violations

Monitoring Site	Year	Number of Days Exceeding Standard				
		State 1-Hour O_3	*State 8-Hour O_3*	*National 8-Hour O_3*	*State 24-hour PM_{10}**	*National 24-hour $PM_{2.5}$**
Escondido – East Valley Parkway	2010	2	5	3	—	—
	2011	1	2	2	—	—
	2012	0	2	0	—	3.1 (1)
	2013	0	4	0	6.0 (1)	1.1 (1)
	2014	1	8	5	—	1.0 (1)

Source: CARB 2014b.
* Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and 3 days, respectively. "Number of days exceeding the standards" is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

Table 2.3-6
SDAPCD Air Quality Significance Thresholds

Construction Emissions	
Pollutant	*Total Emissions (Pounds per Day)*
Respirable Particulate Matter (PM_{10})	100
Fine Particulate Matter ($PM_{2.5}$)	55
Oxides of Nitrogen (NO_x)	250
Oxides of Sulfur (SO_x)	250
Carbon Monoxide (CO)	550
Volatile Organic Compounds (VOC)	75*

Operational Emissions			
Pollutant	*Total Emissions*		
	Pounds per Hour	*Pounds per Day*	*Pounds per Year*
Respirable Particulate Matter (PM_{10})	—	100	15
Fine Particulate Matter ($PM_{2.5}$)	—	55	10
Oxides of Nitrogen (NO_x)	25	250	40
Sulfur Oxides (SO_x)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	—	3.2	0.6
Volatile Organic Compounds (VOC)	—	75*	13.7

Sources: SDAPCD Rules 1501 (SDAPCD 1995) and 20.2(d)(2) (SDAPCD 1998).
* VOC threshold based on the threshold of significance for VOCs from the SCAQMD for the Coachella Valley as stated in the San Diego County Guidelines for Determining Significance.

Table 2.3-7
Construction Phasing and Equipment List

Construction Subphase	Off Road Equipment	Quantity
Phase 1 (January 2018 – December 2024)		
Site Preparation	Crawler Tractors	4
	Loaders	2
	Grinder	1
Grading	Crawler Tractors	11
	Excavators	5
	Graders	4
	Tractors/Loaders/Backhoes	2
	Drill Rigs	15
	Water Trucks	14
	Off Highway Trucks (Volvo A40)	2
	Scrapers	5
Building Construction	Cranes	8
	Forklifts	8
	Generator Sets	8
	Tractors/Loaders/Backhoes	4
Trenching (utilities)	Excavators	2
	Tractors/Loaders/Backhoes	8
	Water Truck	8
Architectural Coating	Air Compressors	20
Paving	Pavers	1
	Paving Equipment (Oiler, Sweeper)	2
	Loader	2
	Water Trucks	4
	Rollers	3
	Scrapers	2
Brush Management/Landscaping	Loader	8
	Dump Truck	4
	Water Truck	8
	Trencher	4
Reservoirs	Excavators	1
	Tractors/Loaders/Backhoes	4
	Generator Sets	3
	Aerial Lifts	4
Phase 2 (December 2020 – November 2027)		
Site Preparation	Crawler Tractors	3
	Loaders	2
	Grinder	1
Grading	Crawler Tractors	7
	Excavators	2
	Graders	2

Table 2.3-7
Construction Phasing and Equipment List

Construction Subphase	Off Road Equipment	Quantity
	Tractors/Loaders/Backhoes	2
	Drill Rigs	6
	Water Trucks	10
	Off Highway Trucks (Cat 777)	7
	Scrapers	5
Building Construction	Cranes	4
	Forklifts	8
	Generator Sets	20
	Tractors/Loaders/Backhoes	4
Trenching (utilities)	Excavators	4
	Tractors/Loaders/Backhoes	2
	Water Truck	8
Architectural Coating	Air Compressors	10
Paving	Pavers	1
	Paving Equipment (Oiler, Sweeper)	2
	Loader	2
	Water Trucks	4
	Rollers	3
	Scrapers	2
Brush Management/Landscaping	Loader	4
	Dump Truck	2
	Water Truck	4
	Trencher	2

Source: Fuscoe 2016. See Appendix A and Appendix B of Appendix G.

Table 2.3-8
Construction Grading Estimates

Activity	Phase 1	Phase 2
Total Grading (acres)	565	11.2
Grading Period (work days)	890	570
On-site Soil Movement (cubic yards)	2,320,570	103,140
Average On-site Haul Distance	0.4 mile	0.8 mile

Sources: Fuscoe 2016. See Appendix A of Appendix G.

Table 2.3-9
Blasting Emissions (pounds per day)

Activity	VOC	NO_x	CO	SO_X	PM_{10}	$PM_{2.5}$
Phase 1 (Jan 2018 – Dec 2024) [1]	—	323.00	1,273.00	38.00	55.89	3.22
Phase 2 (Dec 2020 – Nov 2027) [1]	—	297.50	1,172.50	35.00	55.53	3.20

Source: Appendix C of Appendix G. [1] All grading activities, blasting, and rock crushing operations are anticipated to be completed by the end of 2022 when major earthwork activity would be completed for both phases.

Table 2.3-10
Rock Crushing Emissions (pounds per day)

Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Phase 1 (January 2018 – December 2024) [1]						
Rock Crushing	—	—	—	—	67.31	8.98
Diesel Generator	10.96	158.88	44.17	0.20	3.72	3.72
Total	**10.96**	**158.88**	**44.17**	**0.20**	**71.03**	**12.70**
Phase 2 (December 2020 – November 2027) [1]						
Rock Crushing	—	—	—	—	50.48	6.73
Diesel Generator	7.31	105.92	29.44	0.13	2.48	2.48
Total	**7.31**	**105.92**	**29.44**	**0.13**	**52.96**	**9.21**

Source: Appendix C of Appendix G. [1] All grading activities, blasting, and rock crushing operations are anticipated to be completed by the end of 2022 when major earthwork activity would be completed for both phases.

Table 2.3-11
Estimated Daily Maximum Construction Emissions (pounds per day) - Unmitigated

Activity	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2018						
Construction Activities[1]	32.42	403.69	221.73	0.60	653.31	85.35
Blasting (Phase 1)[2]	—	323.00	1,273.00	38.00	55.89	3.22
Rock Crushing (Phase 1)[2]	10.96	158.88	44.17	0.20	71.03	12.70
Maximum Daily Emissions	**43.38**	**885.57**	**1,538.90**	**44.20**	**780.23**	**101.27**
2019						
Construction Activities[1]	36.91	432.82	260.54	0.70	571.89	71.94
Blasting (Phase 1)[2]	—	323.00	1,273.00	38.00	55.89	3.22
Rock Crushing (Phase 1)[2]	10.96	158.88	44.17	0.20	71.03	12.70
Maximum Daily Emissions	**47.87**	**914.70**	**1,577.71**	**38.90**	**698.81**	**87.86**
2020						
Construction Activities[1]	72.67	538.03	402.76	1.07	640.29	86.21
Blasting (Phase 1)[2]	—	323.00	1,273.00	38.00	55.89	3.22
Rock Crushing (Phase 1)[2]	10.96	158.88	44.17	0.20	71.03	12.70
Maximum Daily Emissions	**83.63**	**1,019.91**	**1,719.93**	**39.27**	**767.21**	**102.13**

Table 2.3-11
Estimated Daily Maximum Construction Emissions (pounds per day) - Unmitigated

Activity	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2021						
Construction Activities[1]	64.16	415.47	360.35	0.91	115.94	30.52
Blasting (Phase 2)[2]	—	297.50	1,172.50	35.00	55.53	3.20
Rock Crushing (Phase 2)[2]	7.31	105.92	29.44	0.13	52.96	9.21
Maximum Daily Emissions	**71.47**	**818.89**	**1,562.29**	**36.04**	**224.43**	**42.93**
2022						
Construction Activities[1]	54.83	314.78	306.64	0.80	89.32	23.41
Blasting (Phase 2)[2]	—	297.50	1,172.50	35.00	55.53	3.20
Rock Crushing (Phase 2)[2]	7.31	105.92	29.44	0.13	52.96	9.21
Maximum Daily Emissions	**62.14**	**718.2**	**1,508.58**	**35.93**	**197.81**	**35.82**
2023						
Construction Activities[1]	40.83	163.24	213.77	0.51	26.31	12.00
2024						
Construction Activities[1]	37.80	138.44	188.40	0.46	23.07	10.13
2025						
Construction Activities[1]	44.86	100.94	141.61	0.32	11.52	5.80
2026						
Construction Activities[1]	44.76	87.56	131.53	0.29	11.52	5.55
2027						
Construction Activities[1]	44.66	87.38	130.65	0.28	11.52	5.55
Maximum Daily Emissions During Any Construction Year	***83.63***	***1,019.91***	***1,719.93***	***38.90***	***780.23***	***102.13***
Pollutant Threshold	*75*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	***Yes***	***Yes***	***Yes***	*No*	***Yes***	***Yes***

1 CalEEMod Version 2016.3.1. Appendix B of Appendix G. Represents maximum daily construction activities from overlapping construction phases at any one point for a given year.
2 Appendix C of Appendix G.

Table 2.3-12
Estimated Daily Maximum Construction Emissions (pounds per day) - Mitigated

Activity	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2018						
Construction Activities[1]	9.58	82.42	269.30	0.60	385.31	43.03
Blasting (Phase 1)[2]	—	323.00	1,273.00	38.00	55.89	3.22
Rock Crushing (Phase 1)[2]	10.96	158.88	44.17	0.20	71.03	12.70
Maximum Daily Emissions	**20.54**	**564.30**	**1,586.47**	**38.80**	**512.23**	**58.95**
2019						
Construction Activities[1]	11.95	90.36	311.40	0.70	344.74	36.99
Blasting (Phase 1)[2]	—	323.00	1,273.00	38.00	55.89	3.22

Table 2.3-12
Estimated Daily Maximum Construction Emissions (pounds per day) - Mitigated

Activity	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Rock Crushing (Phase 1)[2]	10.96	158.88	44.17	0.20	71.03	12.70
Maximum Daily Emissions	**22.91**	**572.24**	**1,628.57**	**38.90**	**471.66**	**52.91**
2020						
Construction Activities[1]	37.79	108.24	466.24	1.07	389.54	44.33
Blasting (Phase 1)[2]	—	323.00	1,273.00	38.00	55.89	3.22
Rock Crushing (Phase 1)[2]	10.96	158.88	44.17	0.20	71.03	12.70
Maximum Daily Emissions	**48.75**	**590.12**	**1,783.41**	**39.27**	**516.46**	**60.25**
2021						
Construction Activities[1]	34.90	69.00	405.28	0.91	70.58	12.16
Blasting (Phase 2)[2]	—	297.50	1,172.50	35.00	55.53	3.20
Rock Crushing (Phase 2)[2]	7.31	105.92	29.44	0.13	52.96	9.21
Maximum Daily Emissions	**42.21**	**472.42**	**1,607.22**	**36.04**	**179.07**	**24.57**
2022						
Construction Activities[1]	32.48	56.84	356.45	0.80	55.96	10.07
Blasting (Phase 2)[2]	—	297.50	1,172.50	35.00	55.53	3.20
Rock Crushing (Phase 2)[2]	7.31	105.92	29.44	0.13	52.96	9.21
Maximum Daily Emissions	**39.79**	**460.26**	**1,558.39**	**35.93**	**164.45**	**22.48**
2023						
Construction Activities[1]	28.11	30.96	231.22	0.51	19.59	5.65
2024						
Construction Activities[1]	26.96	27.19	209.56	0.46	17.79	5.13
2025						
Construction Activities[1]	37.71	17.88	158.52	0.31	8.38	2.48
2026						
Construction Activities[1]	37.61	15.18	143.34	0.28	8.38	2.48
2027						
Construction Activities[1]	37.51	15.00	142.46	0.28	8.37	2.48
Maximum Daily Emissions During Any Construction Year	***48.75***	***590.12***	***1,783.41***	***39.27***	***516.46***	***60.25***
Pollutant Threshold	*75*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	*No*	***Yes***	***Yes***	*No*	***Yes***	***Yes***

1 CalEEMod Version 2016.3.1. Appendix B of Appendix G. Represents maximum daily construction activities from overlapping construction phases at any one point for a given year.
2 Appendix C of Appendix G.

Table 2.3-13
Estimated Daily Maximum Operational Emissions (pounds per day)

	VOC	NO_x	CO	SO_X	PM_{10}	$PM_{2.5}$
Summer						
Area Source Emissions	80.29	33.90	189.56	0.21	3.55	3.55

Table 2.3-13
Estimated Daily Maximum Operational Emissions (pounds per day)

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Energy Emissions	1.36	11.61	4.98	0.07	0.94	0.94
Mobile Emissions	41.23	161.52	535.84	2.19	228.91	62.19
Total	**122.88**	**207.03**	**730.38**	**2.47**	**233.40**	**66.68**
Winter						
Area Source Emissions	80.29	33.90	189.56	0.21	3.55	3.55
Energy Emissions	1.36	11.61	4.98	0.07	0.94	0.94
Mobile Emissions	39.90	166.29	516.60	2.08	228.91	62.20
Total	**121.55**	**211.81**	**711.15**	**2.36**	**233.40**	**66.69**
Maximum Daily Emissions	***122.88***	***211.81***	***730.38***	***2.47***	***233.40***	***66.69***
Pollutant Threshold	*75*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	***Yes***	*No*	***Yes***	*No*	***Yes***	***Yes***

Source: CalEEMod Version 2016.3.1. See Appendix B of Appendix G for complete results.

Table 2.3-14
Estimated Daily Maximum Combined Construction and Operational Emissions (pounds per day)

Activity	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2021						
Phase 1 Construction w/blasting[1]	42.21	472.42	1,607.22	36.04	179.07	24.57
Phase 1 Construction w/o blasting[1]	42.21	174.92	434.72	1.04	123.54	21.37
Phase 1 Operations	13.57	22.80	76.48	0.22	16.76	4.97
Total with blasting	**55.78**	**495.22**	**1,683.70**	**36.26**	**195.83**	**29.54**
Total without blasting	**55.78**	**197.72**	**511.20**	**1.26**	**140.30**	**26.34**
2022						
Phase 1 Construction w/blasting[1]	39.79	460.26	1,558.39	35.93	164.45	22.48
Phase 1 Construction w/o blasting[1]	39.79	162.76	385.89	0.93	108.92	19.28
Phase 1 Operations	13.71	22.24	75.07	0.22	17.08	5.08
Total with blasting	**53.50**	**482.50**	**1,633.46**	**36.15**	**181.53**	**27.56**
Total without blasting	**53.50**	**185.00**	**460.96**	**1.15**	**126.00**	**24.36**
2023						
Phase 1 Construction[1]	28.11	30.96	231.22	0.51	19.59	5.65
Phase 1 Operations	17.23	24.77	91.45	0.28	22.38	6.59
Total	**45.34**	**55.73**	**322.67**	**0.79**	**41.97**	**12.24**
2024						
Phase 1 Construction[1]	26.96	27.19	209.56	0.46	17.79	5.13
Phase 1 Operations	17.97	25.29	92.10	0.29	23.72	6.97
Total	**44.93**	**52.48**	**301.66**	**0.75**	**41.51**	**12.1**
2025						
Phase 1 + Phase 2 Operations	16.09	22.79	82.73	0.26	21.96	6.45

Table 2.3-14
Estimated Daily Maximum Combined Construction and Operational Emissions (pounds per day)

Activity	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Phase 2 Construction[1]	37.71	17.88	158.52	0.31	8.38	2.48
Total	**53.8**	**40.67**	**241.25**	**0.57**	**30.34**	**8.93**
2026						
Phase 1 + Phase 2 Operations	15.82	23.32	85.36	0.26	22.85	6.73
Phase 2 Construction[1]	37.61	15.18	143.34	0.28	8.38	2.48
Total	**53.43**	**38.5**	**228.7**	**0.54**	**31.23**	**9.21**
2027						
Phase 1 + Phase 2 Operations	13.64	20.31	74.38	0.23	20.31	5.98
Phase 2 Construction[1]	37.51	15.00	142.46	0.28	8.37	2.48
Total	**51.15**	**35.31**	**216.84**	**0.51**	**28.68**	**8.46**
Maximum Daily Emissions During Any Year with Blasting	***55.78***	***495.22***	***1,683.70***	***36.26***	***195.83***	***29.54***
Maximum Daily Emissions During Any Year w/o Blasting	***55.78***	***197.72***	***511.20***	***1.26***	***140.30***	***26.34***
Pollutant Threshold	*75*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded with Blasting?	No	**Yes**	**Yes**	No	**Yes**	No
Threshold Exceeded w/o Blasting?	No	No	No	No	**Yes**	No

Source: CalEEMod Version 2016.3.1. Appendix B of Appendix G.
1 Represents maximum daily mitigated construction activities from overlapping construction phases at any one point for a given year.

Table 2.3-15
Pollutants, Sources, Health Effects and Attainment Status

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	*CAAQS*
Ozone (O_3)	Formed when VOCs and NO_x react in the presence of sunlight. VOC sources include any source that burns fuels (e.g., gasoline, natural gas, wood, and oil), solvents, coatings, consumer products, and petroleum processing and storage.	Breathing difficulties, lung tissue damage, and vegetation damage.	Attainment	Nonattainment
Respirable Particulate Matter (PM_{10})	Road dust, windblown dust, agriculture and construction, fireplaces. Also formed from other pollutants (NO_x, SO_x, organics). Incomplete combustion.	Increased respiratory disease, lung damage, cancer, premature death.	Unclassifiable/ Attainment	Nonattainment

Table 2.3-15
Pollutants, Sources, Health Effects and Attainment Status

Pollutant	Sources	Health Effects	Attainment Status	
			NAAQS	*CAAQS*
Fine Particulate Matter ($PM_{2.5}$)	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. Also formed from reaction of other pollutants (NO_x, SO_X, VOCs, and ammonia (NH_3)).	Increases respiratory disease, lung damage, cancer, and premature death,. Particles can aggravate heart diseases such as congestive heart failure and coronary artery disease.	Unclassifiable/ Attainment	Nonattainment
Carbon Monoxide (CO)	Any source that burns fuel such as automobiles, trucks, heavy construction and farming equipment, residential and industrial heating.	Chest pain in heart patients, headaches, reduced mental alertness.	Attainment	Attainment
Nitrogen Dioxide (NO_2)	See carbon monoxide.	Lung irritation and damage. Reacts in the atmosphere to form ozone and acid rain.	Unclassifiable/ Attainment	Attainment
Lead	Metal smelters, resource recovery, leaded gasoline, deterioration of lead paint.	Learning disabilities, brain and kidney damage.	Attainment	Attainment
Sulfur Dioxide (SO_2)	Coal or oil burning power plants and industries, refineries, diesel engines.	Increases lung disease and breathing problems for asthmatics. Reacts in the atmosphere to form acid rain.	Attainment	Attainment
Sulfates	Produced by reaction in the air of SO_2, (see SO_2 sources), a component of acid rain.	Breathing difficulties, aggravates asthma.	(no federal standard)	Attainment
Hydrogen Sulfide	Geothermal power plants, petroleum production and refining, sewer gas.	Headache and breathing difficulties (higher concentrations).	(no federal standard)	Unclassified
Vinyl Chloride	Exhaust gases from factories that manufacture or process vinyl chloride (construction, packaging, and transportation industries)	Central nervous system effects (e.g., dizziness, drowsiness, headaches), kidney irritation, liver damage, liver cancer.	n/a	n/a
Toxic Air Contaminant (TAC)	Combustion engines (stationary and mobile), diesel combustion, storage and use of TAC-containing substances (e.g., gasoline, lead smelting)	Depends on TAC, but may include cancer, mutagenic and/or teratogenic effects, and other acute or chronic health effects.	n/a	n/a

Source: County of San Diego 2007

Table 2.3-16
Summary of DPM Concentrations

Receptor	Annual Average Concentration μg/m³
On-Site Resident (10 meters) – MEIR	0.0015
Off-Site Resident (30 meters)	0.0005

Source: See Appendix D of Appendix G for complete results.
MEIR = Maximally Exposed Individual Resident

Table 2.3-17
Summary of Maximum Cancer Risks - Construction DPM Emissions

Receptor	DPM Annual Concentration (μg/m³)	Cancer Risk
On-Site Resident (10 meters) – MEIR	0.0015	0.7 in 1 million
Off-Site Resident (30 meters)	0.0005	0.2 in 1 million

Source: See Appendix D of Appendix G for complete results.
MEIR = Maximally Exposed Individual Resident

Table 2.3-18
Summary of Maximum Chronic Hazard Indices –
Construction DPM Emissions

Receptor	DPM Annual Concentration (μg/m³)	Chronic Hazard Index
On-Site Resident (10 meters) – MEIR	0.0015	0.0003
Off-Site Resident (30 meters)	0.0005	0.0001

Source: See Appendix D of Appendix G for complete results.
MEIR = Maximally Exposed Individual Resident

Table 2.3-19
CALINE4 Predicted Carbon Monoxide Concentrations

Intersection	Maximum Modeled Impact (ppm)	
	1-hour	*8-hour**
Deer Springs Rd. and I-15 NB Ramps	4.3	3.01
Deer Springs Rd. and I-15 SB Ramps	4.8	3.36
Deer Springs Rd. and Twin Oaks Valley Rd.	4.8	3.36
Buena Creek Rd. and Twin Oaks Valley Rd.	4.6	3.22
Robelini Drive and South Santa Fe Avenue	4.3	3.01
Twin Oaks Valley Rd. and San Marcos Blvd.	4.9	3.43
Twin Oaks Valley Rd. and Discover Rd.	4.9	3.43
Twin Oaks Valley Rd. and Richmar	4.4	3.08
Maximum CO Impact	4.9	3.43
County of San Diego Thresholds	***20***	***9***
Threshold Exceeded?	***No***	***No***

Source: Caltrans 1998a (CALINE4).
Notes: ppm = parts per million.
* 8-hour concentrations were obtained by multiplying the 1-hour concentration by a persistence factor of 0.70 (Caltrans 2010).

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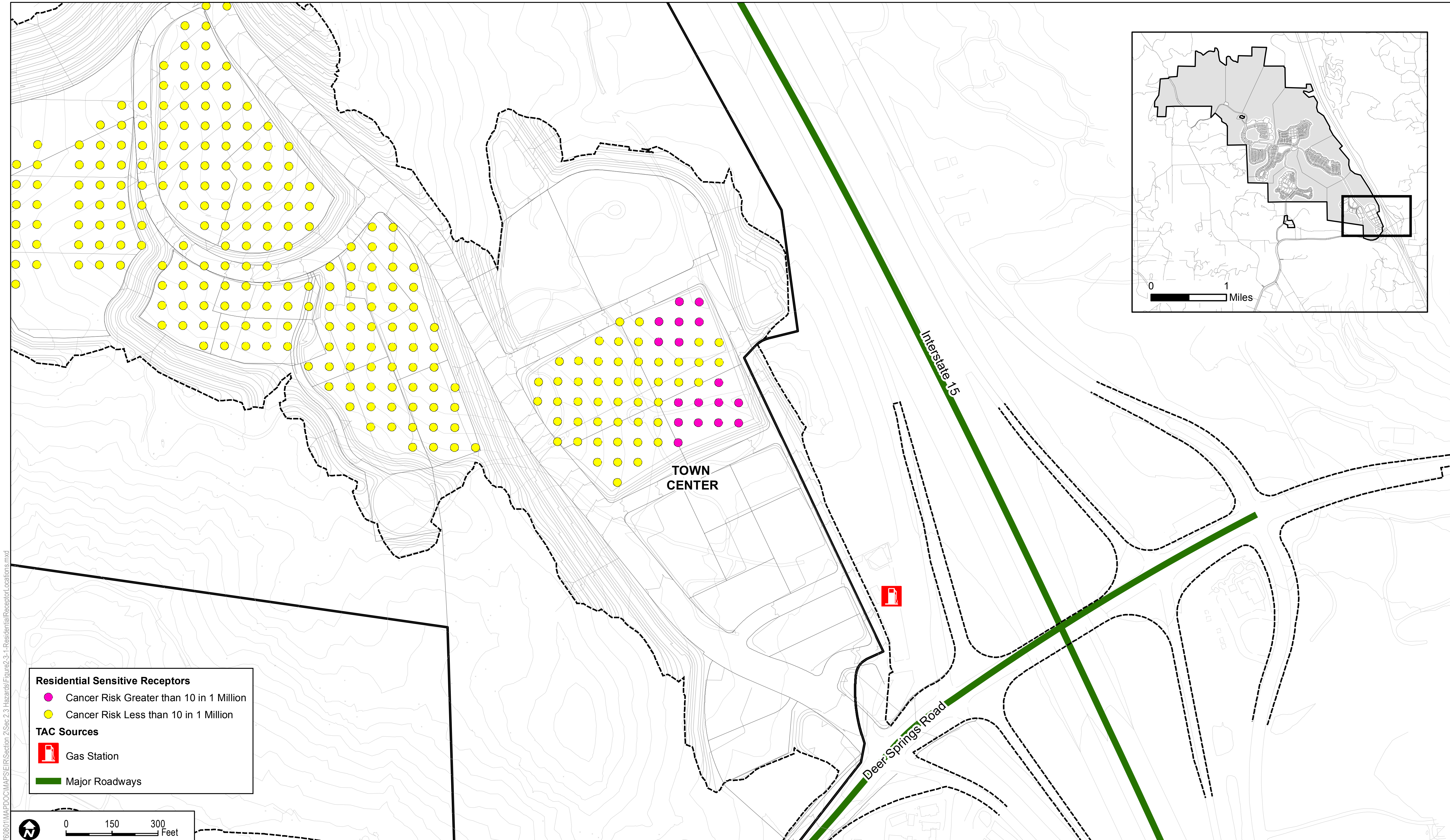

SOURCE: Fuscoe 2016

FIGURE 2.3-1

30-Year Exposure on Residential Receptor Locations

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