2.2 Air Quality

This subchapter of the EIR summarizes the Proposed Project's Air Quality Impact Assessment (HELIX 2015b), contained in Appendix C, which was prepared in conformance with the County Report Requirements for Format and Content for Air Quality Analysis (March 2007). The reader is referred to text below for evaluation of all issues related to air quality for the Project.

2.2.1 Existing Conditions

2.2.1.1 *Regional Meteorology/Climate/Temperature Inversions*

The Proposed Project site is located in the San Diego Air Basin (SDAB). The climate of San Diego County is characterized by hot, dry summers and mild, wet winters and is dominated by a semi-permanent, high-pressure cell located over the Pacific Ocean. Wind monitoring data recorded at the Escondido monitoring station (the closest meteorological monitoring station to the Project site) indicates that the predominant wind direction in the vicinity of the Project site is from the west. Wind speeds over the Project region average 1.7 meters per second (m/s) or 5.58 feet per second (f/s). The annual average temperature in the Project area is approximately 55 degrees Fahrenheit (ºF) during the winter and approximately 74ºF during the summer. Total precipitation in the Project area averages approximately 16.2 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer (Western Regional Climate Center 2012).

The atmospheric conditions of the SDAB contribute to the region's air quality problems. Due to its climate, the SDAB experiences frequent temperature inversions. Typically, temperature decreases with height. Under inversion conditions, however, temperature increases as altitude increases. Temperature inversions prevent air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created due to the interaction between the ocean surface and the lower layer of the atmosphere, creating a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and nitrous oxides react under strong sunlight, creating smog. Light, daytime winds, predominately from the west, further aggravate the condition by driving the air pollutants inland, toward the foothills. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and nitrogen dioxide (NO_2) emissions. High NO_2 levels usually occur during autumn or winter, on days with summer-like conditions.

High air pollution levels in the coastal communities of San Diego often occur when polluted air from the South Coast Air Basin, particularly Los Angeles, travels southwest over the ocean at night, and is brought onshore into San Diego by the sea breeze during the day. Smog transported from the Los Angeles area is a key factor for more than 50 percent of the days San Diego exceeds clean air standards. Ozone and precursor emissions are transported to San Diego during relatively mild Santa Ana weather conditions, although during strong Santa Ana weather conditions, pollutants are pushed far out to sea and miss San Diego. When smog is blown into the SDAB at ground level, the highest ozone concentrations are measured at coastal and near-coastal monitoring stations. When the transported smog is elevated, coastal sites may be passed over, and the transported ozone is measured further inland and on the mountain slopes.

2.2.1.2 *Air Pollutants of Concern*

Federal and state laws regulate air pollutants emitted into the ambient air by stationary and mobile sources. These regulated air pollutants are known as "criteria air pollutants" and are categorized as primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Secondary pollutants form in the air when primary pollutants react or interact. Criteria pollutants are defined by state and federal law as a risk to the health and welfare of the general public. Specific descriptions of health effects for each of the following air pollutants are in Appendix C.

Ozone. Ozone is formed when VOCs and oxides of nitrogen (NO_X), both by-products of fuel combustion, react in the presence of ultraviolet light.

Carbon Monoxide. CO is a product of fuel combustion; the main source of CO in the SDAB is from motor vehicle exhaust.

Nitrogen Dioxide. NO_2 is also a by-product of fuel combustion and is formed both directly as a product of combustion and in the atmosphere through the reaction of nitrogen oxide (NO) with oxygen.

Respirable Particulate Matter and Fine Particulate Matter. Respirable particulate matter, or PM_{10}, refers to particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter, or $PM_{2.5}$, refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. PM_{10} and $PM_{2.5}$ arise from a variety of sources, including road dust, diesel exhaust, fuel combustion, tire and brake wear, construction operations and windblown dust.

Sulfur Dioxide. Sulfur dioxide (SO_2) is a colorless, reactive gas that is produced from the burning of sulfur-containing fuels such as coal and oil, and by other industrial processes.

Lead. Lead (Pb) in the atmosphere occurs as particulate matter. Lead has historically been emitted from vehicles combusting leaded gasoline, as well as from industrial sources. With the phase-out of leaded gasoline, large manufacturing facilities are the sources of the largest amounts of lead emissions.

Sulfates. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur.

Hydrogen Sulfide. Hydrogen sulfide (H_2S) is a colorless gas formed during bacterial decomposition of sulfur-containing organic substances.

Vinyl Chloride. Vinyl chloride, a chlorinated hydrocarbon, is a colorless gas used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

- **Visibility-Reducing Particles.** Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt. These particles in the atmosphere would obstruct the range of visibility. California standards are intended to limit the frequency and severity of visibility impairment due to regional haze.

The public's exposure to toxic air contaminants (TACs) is another environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The Health and Safety Code (§39655, subd. (a).) defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the Federal Act (42 United States Code [USC] Section 7412[b]) is a TAC; these substances are controlled under a different regulatory process than criteria pollutants. Under state law, the California Environmental Protection Agency (CalEPA), acting through CARB, is authorized to identify a substance as a TAC if it determines the substance meets the Health and Safety Code definition noted above.

TACs are evaluated in terms of cancer risks and non-cancer health risks. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. Unlike carcinogens, it is believed that there is a threshold level of exposure to most non-carcinogens below which they will not pose a health risk. CalEPA and the California Office of Environmental Health Hazard Assessment (OEHHA) have developed reference exposure levels (RELs) for non-carcinogenic impacts of TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

2.2.1.3 *Background Air Quality*

Table 2.2-1 presents a summary of the adopted ambient federal and state air quality standards that are used to determine attainment or non-attainment.

The SDAPCD operates a County-wide network of air monitoring stations to measure ambient concentrations of pollutants and determine whether the ambient air quality meets the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). The nearest ambient monitoring stations to the Proposed Project site are the Escondido East Valley Parkway station and the San Diego 12th Avenue station (which is the closest station that measures SO_2). Because both the Escondido East Valley Parkway and San Diego 12th Avenue monitoring stations are located in areas where there is substantial traffic congestion, it is likely that pollutant concentrations measured at those monitoring stations are higher than concentrations that would be observed or measured in the Project area, and would thus provide a conservative estimate of background ambient air quality.

In particular, concentrations of CO at the Escondido monitoring station tend to be among the highest in the SDAB due to the fact that the monitor is located along East Valley Parkway in a congested area of downtown Escondido. The station sees higher concentrations of CO than have historically been measured elsewhere in San Diego County, and the background data are not likely to be representative of background ambient CO concentrations at the Proposed Project site due to the site's location in a less developed area.

Ambient concentrations of pollutants over the last five years are presented in Table 2.2-3, *Ambient Background Concentrations – San Diego Monitoring Stations*. The 1-hour state ozone standard was not exceeded in 2009, 2012, or 2013, but was exceeded two times in 2010, and one time in 2011 at the Escondido monitoring station during the period from 2009 through 2013. The 8-hour state ozone standard was exceeded nine times in 2009, five times in 2010, two times in 2011, two times in 2012, and four times in 2013. The federal 8-hour ozone standard was exceeded at the Escondido monitoring station one time in 2009, three times in 2010, and two times in 2011. The federal 24-hour $PM_{2.5}$ standard was exceeded two times in 2009 and one time in both 2012 and 2013. The Escondido monitoring station measured exceedances of the state 24-hour PM_{10} standard one time in both 2009 and 2013. The annual PM_{10} and $PM_{2.5}$ standards were both exceeded in 2009 and the annual PM_{10} standard was also exceeded in 2013. The data from the monitoring stations indicate that air quality is in attainment of all other federal and state NO_2, CO and SO_2 standards.

2.2.1.4 *Regulatory Setting*

Federal and State Regulations and Standards

At the federal level, the USEPA is responsible for enforcing the federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish NAAQS, which identify concentrations of airborne pollutants below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for criteria pollutants (specifically, ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The state agency responsible for coordination of state and local air pollution control programs is the CARB, which established the more stringent CAAQS for the six criteria pollutants through the California Clean Air Act of 1988 (CCAA), and also has established CAAQS for additional pollutants, including sulfates, H_2S, vinyl chloride and visibility-reducing particles. Adopted NAAQS and CAAQS are shown in Table 2.2-1, *Ambient Air Quality Standards*.

CARB also is responsible for the development, adoption, and enforcement of the state's motor vehicle emissions program and the SIP with input from local agencies. The SDAPCD has developed its input to the SIP, which includes the SDAPCD's plans and control measures for attaining the ozone NAAQS. The SDAPCD submitted an air quality plan to USEPA in 2007; the plan demonstrated how the 8-hour ozone standard would be attained by 2009. Despite best efforts, SDAB did not meet the ozone NAAQS in 2008 and 2009, and the SDAPCD is currently revising their air quality plan. These plans accommodate emissions from all sources, including natural sources, through implementation of control measures, where feasible, on stationary sources to attain the standards. Mobile sources are regulated by the USEPA and the CARB, and the emissions and reduction strategies related to mobile sources are considered in the RAQS and SIP.

Local Regulations and Standards

Areas that do not meet the NAAQS or CAAQS for a particular pollutant are considered to be "non-attainment areas" for that pollutant. CARB reviews operations and programs of the local air districts, and requires each air district with jurisdiction over a non-attainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The SDAPCD is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County.

The SDAPCD and SANDAG are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County RAQS was initially adopted in 1991, and was updated in 1995, 1998, 2001, 2004 and 2009. The local RAQS, in combination with those from all other California non-attainment areas with serious (or worse) air quality problems, is submitted to the CARB, which develops the SIP.

The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the County as part of the development of the County's General Plan, and by cities within the County. As such, projects that propose development consistent with, or less dense than, the growth anticipated by the general plans would be consistent with the RAQS. If a project proposed development greater than that anticipated in a general plan and SANDAG's growth projections, the project might be in conflict with the RAQS and SIP, and might have a potentially significant impact on air quality.

In addition, SDAPCD Rule 51 (Public Nuisance) also prohibits emission of any material causing nuisance to a considerable number of persons or endangers the comfort, health or safety of any person. Rule 55 prohibits construction activity that would discharge fugitive dust emissions into the atmosphere beyond the property line. Finally, Rule 67 prohibits the use of architectural coatings (i.e., paints) that would exceed VOC content limits specified for each coating category in the rule.

Air Basin Attainment Status

Federal Attainment

On April 30, 2012, the SDAB was classified as a marginal nonattainment area for the 8-hour NAAQS for ozone. The SDAB is an attainment area for the NAAQS for all other criteria pollutants. The SDAB currently falls under a national “maintenance plan” for CO, following a 1998 redesignation as a CO attainment area (SDAPCD 2012).

On December 14, 2012, the federal annual standard for $PM_{2.5}$ was decreased from 15 µg/m^3 to 12 µg/m^3. The USEPA made no changes to the primary 24-hour $PM_{2.5}$ standard or to the secondary $PM_{2.5}$ standards. At least three years of monitoring data, beginning March 14, 2013, will be necessary before the USEPA redesignates the San Diego County for the annual $PM_{2.5}$ standard.

State Attainment

The SDAB is currently classified as a non-attainment area under the CAAQS for ozone (serious non-attainment), PM_{10}, and $PM_{2.5}$ (CARB 2009). Each non-attainment area must submit a SIP outlining the combination of local, state, and federal actions and emission control regulations necessary to bring the area into attainment as expeditiously as practicable. Then, even after the nonattainment area attains the air quality standard, it will remain designated as a nonattainment area unless and until the state submits a formal request for redesignation to attainment to the USEPA. The request must include a “maintenance” plan demonstrating that the area will maintain compliance with that NAAQS for at least 10 years after USEPA redesignates the area to attainment.

On December 05, 2012, the SDAPCD adopted its *Ozone Redesignation Request and Maintenance Plan*, which calls for the SDAB to attain the 1997 federal 8-hour ozone NAAQS, with a request for redesignation to attainment/maintenance area. On December 6, 2012, the CARB approved the *Redesignation Request and Maintenance Plan for the 1997 National Ozone Standard for San Diego County* for submittal to USEPA as a SIP revision. On December 20, 2012, the USEPA initiated its adequacy review of the plan and posted the document for a 30-day public review period that closed January 22, 2013. On March 25, 2013, the USEPA approved the redesignation to the 1997 8-hour ozone attainment/maintenance plan. Redesignation to attainment of the 1997 standard does not affect the region’s marginal nonattainment status for the 2008 standard (SDAPCD 2012).

A more detailed discussion of the redesignation request and maintenance plan is provided in Appendix C. Table 2.2-2, *Federal and State Air Quality Designations*, summarizes the region’s attainment status for all applicable criteria pollutants.

2.2.2 Analysis of Project Effects and Determination as to Significance

2.2.2.1 *Conformance to the RAQS*

Guideline for the Determination of Significance

The Proposed Project would have a potentially significant environmental impact if it would:

1. Conflict with or obstruct the implementation of the San Diego RAQS and/or applicable portions of the SIP.

Guideline Source

Guideline No. 1 is taken from the County Guidelines for Determining Significance – Air Quality (2007c).

Analysis

The Proposed Project involves a Specific Plan and General Plan Amendment and is proposing more intense residential development than accounted for in the General Plan, and therefore, the 2009 RAQS. The Proposed Project is located in the North County East Major Statistical Area, in the San Marcos and Escondido Subregional Areas. The current 2009 RAQS are based on projections for residential, commercial, industrial and recreational land uses contained in the County's previous General Plan (prior to 2011) that was in place at the time the RAQS were adopted in 2009. It should be noted that population and vehicle miles traveled (VMT) growth projections in SANDAG's 2030 Regional Transportation Plan (RTP) were used in the 2009 RAQS. In relation to the residential developments, the General Plan and 2030 RTP projected lower population (i.e., number of residences) at buildout than the Proposed Project. Implementation of the Proposed Project would result in greater residential units in the unincorporated area of the County than assumed in the General Plan and 2030 RTP.

The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for ozone. The RAQS relies 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 and specific plans.

For the Proposed Project, the total number of units for residential land uses is proposed to increase from 118 units to 326 units (see Section 4.3, *General Plan Density Alternative*). While potential conflicts with the RAQS may occur when a proposed development, such as the Proposed Project, seeks to increase the number of units which were in effect at the time the RAQS were formulated, the effect on anticipated population is also important. With respect to this second factor, it is important to note that the population of San Diego County has not reached the maximum level assumed by the latest version of the RAQS (2009).

The 2030 RTP, which was adopted in 2009 (the same year when the RAQS were last updated) predicted a population for the year 2010 of 3,245,279 in San Diego County. However, according to the California Department of Finance, the population of San Diego County as of July 1, 2011 was 3,131,254. The additional 208 residential units proposed by the Project would result in an increase of 572 residents to the County, which could be accommodated within the 114,025 person surplus between projected and actual population growth.

The total cumulative housing projected for the San Marcos and Escondido Subregional Areas for 2030, according to SANDAG projections used for the 2030 RTP, is an additional 38,160 du. The Proposed Project's projected net increase of 208 du, when added to the cumulative housing units projected for the San Marcos and Escondido Subregional Areas (based on the cumulative projects identified in the Valiano Traffic Impact Analysis (TIA; LLG 2015), totals 326 du, which is below SANDAG's 2030 projected growth for the North County East Major Statistical Area of 54,251 du, and less than SANDAG's 2030 projected growth of 38,160 du for the San Marcos and Escondido Subregional Areas.

The Proposed Project has been designed to include Smart Growth concepts which groups residential uses around services and jobs such as the nearby Palomar Medical Hospital, Palomar Power Plant, Stone Brewery, and other various manufacturing, retail, and office business park sites located within a travel distance of approximately one mile, which in return helps to reduce the average VMT for the average commuter. The CalEEMod modeling analysis for the Proposed Project was conducted using a conservative approach and did not include any Smart Growth features (HELIX 2015b).

It is relevant to note that the Proposed Project would be largely consistent with growth envisioned both in GP 2020 and the SANDAG 2050 Regional Transportation Plan (RTP; SANDAG 2011) projections (including projections for traffic, water supply, and supporting infrastructure) that are based on GP 2020 land use designations. Further, the current population and housing in San Diego County are lower than what was projected for the region, and therefore it is unlikely that the additional units from the Proposed Project would interfere with the SDAPCD's goals for improving air quality in the SDAB. Further, the SDAPCD is currently updating the RAQS to reflect the most recent regional population projections. Because the Proposed Project is proposing an increase in housing units beyond what was included for the site in the most recent (2009) version of the RAQS, however, **impacts associated with conformance to regional air quality plans would be potentially significant**. **(Impact AQ-1)**

2.2.2.2 *Conformance to Federal and State Ambient Air Quality Standards*

<u>Guideline for the Determination of Significance</u>

The Proposed Project would have a potentially significant environmental impact if it would:

2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation, as follows:

    a. Ozone Precursors: The Proposed Project would result in emissions that exceed 250 pounds per day of (lbs/day) NO_X or 75 lbs/day of VOCs.

b. Carbon Monoxide: The Proposed Project would result in emissions of carbon monoxide of 550 lbs/day, and when totaled with the ambient concentrations exceed a 1-hour concentration of 20 parts per million (ppm) or an 8-hour average of 9 ppm.

c. Fine Particulate Matter: The Proposed Project would result in emissions of $PM_{2.5}$ that exceed 55 lbs/day.

d. Particulate Matter: The Proposed Project would result in emissions of PM_{10} that exceed 100 lbs/day and increase the ambient PM_{10} concentration by 5 micrograms per cubic meter ($\mu g/m^3$) or greater at any sensitive receptor locations (or maximum exposed individual [MEI], a term commonly used by CARB for sensitive receptors).

Guideline Source

Guideline No. 2 is taken from the County Guidelines for Determining Significance -Air Quality (2007c).

<u>Analysis</u>

The County recognizes the SDAPCD's established screening level thresholds for air quality emissions (Rules 20.1 et seq.) as screening-level thresholds for land development projects. As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIA). The County has also adopted the SCAQMD's screening threshold of 55 lbs/day or 10 tons per year as a screening level threshold for $PM_{2.5}$. The screening thresholds used in the following analysis are included in Table 2.2-4, *Screening-level Thresholds for Air Quality Impact Analysis.*

The construction activities associated with the Proposed Project would create diesel emissions, and would generate emissions of dust. In general, emissions from diesel-powered equipment contain more NO_X, oxides of sulfur (SO_X), and particulate matter than gasoline-powered engines. Diesel-powered engines, however, generally produce less CO and less reactive organic gases than do gasoline-powered engines. Standard construction equipment includes dozers, rollers, scrapers, backhoes, loaders, paving equipment, delivery/haul trucks, and so on. Emissions associated with construction of the Proposed Project were calculated assuming that the construction duration period would begin in January 2016 and last until mid-2019.

Construction

For the purpose of the analysis, construction is broken down into three main construction phases, with five individual neighborhoods to be constructed separately (with the exception of Neighborhoods 1 and 5, which would be constructed together). The first phase focuses on overall site grading and rock blasting, which would begin in 2016 and last approximately two years. The second phase would be the infrastructure installation, which includes the construction of the WTWRF, utility connections, and roadways. The infrastructure phase would last approximately one year. The third phase addresses "vertical" development of the Proposed

Project, which includes constructing the residential buildings and coating the pavement/ architecture, which would take approximately 2.5 years.

Blasting

Blasting may be required at the site during initial site preparation and grading activity. Blasting operations would be conducted through the use of drilling and blasting to fracture rocks. At this time the exact amount of blasting has not been determined, however, it is assumed that approximately two to three blasting events may occur each week. Blasting operations would be conducted by a licensed blasting contractor, in strict compliance with pertinent federal, state, and County requirements. All blasting materials would be transported to the site for each blasting sequence and no explosives would be stored at the site. A single drill rig would be used to drill a pattern of bore holes each with a 3- to 6-inch diameter. Several holes are drilled in a 400-s.f. area. Typically, the pattern is laid out in a 20-by-20-foot grid, with up to approximately 25-foot-deep holes. A contractor then loads the holes with carefully metered explosives. The "shot" is timed to detonate each hole(s) in sequence. This minimizes the ground vibration and noise of the blast, while maximizing fracture of the rock. Some dust is created as a result of the blast, although the dust would be fully dissipated within 30 to 60 seconds following the shot. The rock would be broken up to sizes less than 18 inches in diameter.

Following blasting, the rock resource would be fractured and can be moved with conventional earthmoving equipment. A front-end loader would be used to spread the fractured rocks around the site for balanced cut/fill grading.

Fugitive dust emissions associated with blasting can be estimated based on the USEPA's emission factor for blasting for coal mining to remove overburden, which is a similar process. According to Section 11.9 of AP-42, emissions from blasting would be calculated as follows:

Pounds (lbs) PM_{10}/blast = $0.000014(A)^{1.5}$ x 0.52 lbs PM_{10}/lbs total suspended particulates (TSP)

Where:

A is the area of blasting, which is approximately 400-s.f.

The Proposed Project would utilize ammonium nitrate/fuel oil (ANFO) explosives to conduct blasting on site. Based on the USEPA's AP-42 Section 13.3 emission factors, emissions from use of ANFO are estimated at 67 lbs CO per ton of explosive, and 17 lbs NO_X per ton of explosive. Based on typical construction projects, it was estimated that a maximum of 2,500 lbs/day (or 1.25 tons per day) could be used at the site; thus, the maximum daily emissions due to the use of ANFO would be 83.75 lbs/day of CO and 21 lbs/day of NO_X. The emission calculations for the drilling and blasting activities are provided in Appendix C of EIR Appendix C.

Infrastructure Installation (Utilities, Roads and WTWRF)

Following the mass grading and rock blasting, backbone infrastructure would be installed. This would consist of all the elements necessary to support developed uses on site, such as construction of roads, off-site connections to a potable water source and sewer lines, the construction of the WTWRF and associated pump stations, and the connection of all utility lines between these facilities and the Proposed Project boundary.

Dedication of the biological open space areas also would occur as a first action during this phase, with concurrent monitoring of construction activities adjacent to any open space set aside.

In order to provide a conservative assessment of potential emissions of criteria pollutants, the worst-case (peak) construction day was analyzed for this phase.

The proposed site of the WTWRF is currently occupied by the existing horse equestrian facility. Several structures would be demolished during Phase 2. Because of the lack of specific details for the WTWRF, the default data from CalEEMod Version 2013.2.2, developed by SCAQMD, was used to estimate the construction emissions. It is known that the construction of WTWRF would occur on approximately 0.4 acre lot (i.e., approximately 20,000 s.f. for General Light Industrial) with approximately six months of construction activity used in the CalEEMod construction modeling analysis.

The emissions of criteria pollutants from the construction activities for the off-site roadway areas were calculated using the Road Construction Emissions Model Version 7.1.5.1, developed by Sacramento Metropolitan Air Quality Management District (SMAQMD). This model is typically used instead of (or in addition to) CalEEMod for linear roadway-type construction projects. Earthwork for the off-site road improvements would be balanced for Hill Valley Road and would include 6,200 cubic yards of export for Mt. Whitney Road.

Vertical Construction

Vertical construction of buildings is anticipated to take 2.5 years. The plan assumes that the residential neighborhoods would be constructed sequentially; however, the specific order of development would be market driven and cannot be specified at this time. This plan anticipates that Neighborhoods 1 and 5 would be developed first, Neighborhood 2 would be developed second, Neighborhood 3 would be developed third, and Neighborhood 4 would be developed last. As a result, building construction for some neighborhoods may overlap with previously constructed neighborhoods that are occupied and in operation.

The following options were selected in the CalEEMod model: site preparation, grading, trenching (backbone infrastructure), building construction, paving, and architectural coatings. Grading activity would be substantially balanced, meaning that no significant quantity of soil would be transported off site for disposal nor would soil be transported on site for use in construction activities.

Although it was assumed that all of dust control measures would be implemented, to model the most conservative construction estimates, only application of water during grading was taken into consideration when applying a control efficiency on particulate emissions. Based on the CalEEMod, Version 2013.2.2, the control efficiency for watering two times daily is 55 percent. For conservative purposes, the other control measures were not accounted for in the construction emission calculations.

Coatings used for the Proposed Project would have to conform to the SDAPCD Rule 67, which prohibits the use of architectural coatings (i.e., paints) that would exceed VOC content limits specified for each coating category in the rule. For modeling the Proposed Project's emissions in CalEEMod, conformance with these rules was therefore assumed. According to Rule 67, residential interior and exterior coatings must have a VOC content less than or equal to 100 g/L, and non-residential exterior and interior coatings must have a content less than or equal to 250 g/L. The quantities of coatings that would be applied to the interior and exterior of the new buildings were estimated from the area of the surfaces to be coated and the required thickness of the coating. According to Table 3.1 of Appendix D of the CalEEMod User's Guide, the default assumptions are that each single family residence would require approximately 4,860 s.f. of paint coating.

Construction of the Proposed Project would require paving surface streets with asphalt. Asphaltic paving generates VOC emissions when the asphalt cures. VOC emissions from the paving were calculated using the CalEEMod default emission factors. According to the CalEEMod model, emissions from asphalt off-gassing can be estimated by assuming an emission rate of 2.62 lbs/acre of area to be paved. The amount to be paved was estimated to be one acre per day during the paving construction phase.

Construction would require heavy equipment during mass grading, utility installations, building construction and paving. Construction equipment estimates are based on Proposed Project assumptions provided and default values in the CalEEMod, Version 2013.2.2 model. Beginning January 1, 2013, CARB requires all off-road equipment greater than 50 horsepower (hp) to comply with the USEPA Tier 2 through 4 engine emission standards and install PM filter devices. Table 2.2-5, *Equipment Requirements for Construction of the Proposed Project*, presents a summary of the assumed equipment that would be involved in each stage of construction.

The engines of on-site construction equipment produce combustion emissions. Depending on the construction phase, construction equipment may include air compressors, lifts, boom trucks, cranes, graders, excavators, backhoes, loaders, welders, generators, and concrete pumps. The CalEEMod and Road Construction models provided the default list on the types and number of pieces of construction equipment to be used during each construction phase. The equipment was assumed to operate at a typical eight hours per day schedule.

All construction equipment operating on the project site should meet USEPA-Certified Tier 4 emissions standards. In addition, all construction equipment would be outfitted with best available control technology (BACT) devices certified by the CARB. Any emissions control device used by the contractor would achieve emissions reductions that are no less than what could be achieved by a Level 2 diesel emissions control strategy for a similarly sized engine in accordance with the CARB regulations.

The Project would incorporate all measures specified in Mitigation Measure Air-2.5 of the San Diego County General Plan Update Final EIR.

Short-term Construction Emissions

Construction activities are anticipated to overlap occasionally throughout each year of construction, with 2019 being the only exception. Table 2.2-6, *Estimated 2016 Worst-case Construction Emissions - By Overlapping Construction Activities*, Table 2.2-7, *Estimated 2017 Worst-case Construction Emissions - By Overlapping Construction Activities,* and Table 2.2-8, *Estimated 2018 Worst-case Construction Emissions - By Overlapping Construction Activities,* provide summaries of the maximum daily construction emission estimates during each construction activity overlap for construction years 2016 to 2018, respectively. Table 2.2-9, *Estimated 2019 Worst-case Construction Emissions,* provides a summary of the maximum daily construction emission estimates during 2019. As noted above, it was assumed that dust control measures (watering a minimum of two times daily) would be employed to reduce emissions of fugitive dust during site grading. The maximum daily emissions are compared to the daily emission thresholds to determine significance.

As shown in Tables 2.2-6 through 2.2-9, with the minimum application of USEPA Tier 4 equipment, CARB diesel particulate filter devices, and BMPs to control emissions of fugitive dust, emissions of all criteria pollutants, including PM_{10} and $PM_{2.5}$, would be below the daily thresholds during construction. The off-road diesel vehicle regulation applies to new equipment commonly purchased or leased for construction projects. Out-of-state companies doing business in California are also subject to the regulation. It should be noted that this regulation does not apply to existing equipment with less than 20 years old already purchased or leased by contractors.

Emissions of all criteria pollutants during construction would be below the daily thresholds. Construction of the Proposed Project would, therefore, not conflict with the NAAQS or CAAQS, and **construction emissions associated with air quality would be less than significant**.

Operation

The main operational emissions sources associated with the Proposed Project are associated with traffic; emissions associated with area sources such as energy use, landscaping, and the use of fireplaces at the residences also would be generated.

Project-generated traffic was addressed in the Proposed Project's TIA (Linscott, Law & Greenspan [LLG] 2015). Based on the TIA, at full buildout the Proposed Project would generate 3,786 ADT. Motor vehicle emission rates are based on CARB's EMFAC state-wide emission factors for the San Diego County region. Emission factors representing the vehicle mix for emission analysis years 2018 through 2020 were used to estimate emissions. Based on the results of the CalEEMod model for subsequent years, emissions would decrease on an annual basis from 2018 onward due to phase-out of higher polluting vehicles and implementation of more stringent emission standards. Default vehicle speeds, trip lengths, trip purpose and trip type percentages for single family homes were used. Trip rates were based on the TIA, which estimated 10 daily trips per du for Neighborhoods 1, 2, 4, and 48 residential units in 5; 12 daily trips per du for Neighborhoods 3 and the remaining residential units in 5; a total of 324 daily trips from multi-generational Second Dwelling Units in Neighborhoods 2, 3, and 5; and 10 total daily trips for the WTWRF. Four additional trips per day were added to the analysis to account for the public Neighborhood Park and Staging Area.

Residential units would be conditioned to have no wood-burning fireplaces and were assumed to only have natural gas fireplaces. Area source emissions, including emissions from energy use, fireplaces, landscaping, and maintenance use of architectural coatings, were calculated using the CalEEMod model. Table 2.2-10, *Operational Emissions in 2018*, Table 2.2-11, *Operational Emissions in 2019*, and Table 2.2-12, *Operational Emissions in 2020*, present the summary of annual operational emissions for neighborhoods anticipated to operate within that year. Operational emissions include emissions from off-road equipment (i.e., generators associated with the fire pump station and the WTWRF) and other emissions associated with the WTWRF such as VOC emissions, the embodied electrical energy consumptions, and workers and delivery vehicle trips.

As shown in Tables 2.2-10, 2.2-11 and 2.2-12, Proposed Project emissions of all criteria pollutants during operation would be below the daily thresholds. Therefore, **operation of the Project would result in a less than significant direct impact on air quality from criteria pollutant emissions**.

Due to the anticipated construction of the neighborhoods, it is possible that occupation of a neighborhood may occur concurrently with construction of another neighborhood. Based on the construction schedule, two worst-case scenarios (with concurrent neighborhood operation and construction) were identified. As shown in Table 2.2-13, *Worst-case 2018 Daily Emissions - Concurrent Operation and Construction*, the first scenario assumes that Neighborhoods 1 and 5 would be occupied and operating concurrent with construction activities of Neighborhoods 2 and 4 (vertical building and backbone infrastructure, respectively). Table 2.2-14, *Worst-case 2019 Daily Emissions - Concurrent Operation and Construction*, shows the combined emissions during operation of Neighborhoods 1, 2, 3 and 5 and vertical construction of Neighborhood 4. Operational emissions from the WTWRF and generators are also included in both worst-case scenarios.

The combined construction and operational emissions would be below the significance threshold for all criteria pollutants, and would, therefore, be less than significant. All other pollutants would not exceed the significance thresholds. Accordingly, **combined construction and operational emissions would result in less than significant direct impacts related to air quality from criteria pollutant emissions**.

Traffic-related CO Concentrations (CO Hot Spot Analysis)

Vehicle exhaust is the primary source of CO. In an urban setting the highest CO concentrations are generally found within close proximity to congested intersections. Under typical meteorological conditions, CO concentrations tend to decrease as distance from the emissions source (i.e., congested intersection) increases. Project-generated traffic has the potential of contributing to localized hot spots of CO off site. Because CO is a byproduct of incomplete combustion, exhaust emissions are worse when fossil-fueled vehicles are operated inefficiently, such as in stop-and-go traffic or through heavily congested intersections, where the level of service (LOS) is severely degraded.

The CARB also recommends evaluation of the potential for the formation of locally high concentrations of CO, known as CO hot spots. A CO hot spot is a localized concentration of CO that is above the state or national 1-hour or 8-hour CO ambient air standards. To verify that the Proposed Project would not cause or contribute to a violation of the 1-hour and 8-hour CO standards, an evaluation of the potential for CO hot spots at nearby intersections was conducted.

The TIA (LLG 2015) evaluated whether or not there would be a decrease in the LOS at the intersections affected by the Proposed Project. The potential for CO hot spots was evaluated based on the results of the TIA. The Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998) was followed to determine whether a CO hot spot is likely to form due to Project-generated traffic. In accordance with the Protocol, CO hot spots are typically evaluated when: (a) the LOS of an intersection or roadway decreases to a LOS E or worse; (b) signalization and/or channelization is added to an intersection; and, (c) sensitive receptors such as residences, schools, hospitals, etc. are located in the vicinity of the affected intersection or roadway segment.

According to the TIA, all intersections under the Existing Plus Project scenario are calculated to continue to operate at acceptable LOS of D or better (LLG 2015). Therefore, the LOS would not decrease to a rating of E or worse, and as a result, no exceedances of the CO standard are expected. The Existing Plus Project scenario would not cause or contribute to a violation of the air quality standard, and **associated impacts would be less than significant**.

2.2.2.3 *Cumulatively Considerable Net Increase of Criteria Pollutants*

Guideline for the Determination of Significance

The Proposed Project would have a potentially significant environmental impact if it would:

3. Result in a cumulatively considerable net increase of any criteria pollutant for which the SDAB is non-attainment under an applicable federal or state ambient air quality standard (including emissions which exceed the screening-level thresholds for ozone precursors listed in Table 2.2-4).

   a. Construction Phase (Direct): A project that has a significant direct impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NO_X, and/or VOCs, would also have a significant cumulatively considerable net increase.

b. Construction Phase (Cumulative): 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 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 County guidelines identified in Subsection 2.2.2.2.

c. Operational Phase: A project that does not conform to the RAQS and/or has a significant direct impact on air quality with regard to operational emissions of PM_{10}, $PM_{2.5}$, NO_X, and/or VOCs, would also have a significant cumulatively considerable net increase.

d. Operational Phase: Projects that cause road intersections to operate at or below LOS 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 "hot spot" create a cumulatively considerable net increase of CO.

Guideline Source

Guideline No. 3 is taken from the County Guidelines for Determining Significance – Air Quality (2007c).

<u>Analysis</u>

Construction

As discussed in Subsection 2.2.2.2, Proposed Project emissions of VOC, NO_X, PM_{10} and $PM_{2.5}$ during construction would be below the screening-level thresholds and would result in a less than significant air quality impact. Based on the information from the TIA, there are 41cumulative projects expected to contribute to the overall growth within the five-mile buffer area. Based on research conducted for the cumulative condition, 3 County of San Diego projects, 31City of San Marcos projects, and 7 City of Escondido projects were identified for inclusion in the cumulative air quality analysis.

The SDAB has been designated as a federal nonattainment area for ozone, and a state nonattainment area for ozone, PM_{10} and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB. Therefore, a regional cumulative impact currently exists for ozone precursors and PM_{10} and $PM_{2.5}$.

As discussed above, the emissions of all criteria pollutants, including PM_{10} and $PM_{2.5}$, would be well below the significance levels during construction. Construction would be temporary and consistent with the size and scale of the Proposed Project. Construction activities required for the Proposed Project would result in less than significant impacts to air quality; however, it is possible that construction associated with several other projects in the general vicinity of the

Proposed Project could occur at the same time, and cumulative construction projects would result in a cumulatively considerable net increase in VOC, NO_X, PM_{10} and $PM_{2.5}$. **The Proposed Project would result in a cumulatively considerable net increase in criteria pollutants during construction and impacts would be significant. (Impact AQ-2)**

Operation

As stated above, in addition to the Proposed Project, there are 41cumulative projects expected to contribute to the overall growth within the five-mile buffer area (LLG 2014). The current General Plan designations on the Project site are SR-1 and SR-2, and the Regional Category is Semi Rural. Under the current General Plan, a maximum of 118 residences are permitted (at a minimum of one-acre lot sizes). Applying the average trip rate from the TIA (11.3 trips per du), approximately 1,334 ADT would be generated by the existing zoning. The proposed 334 residences associated with the Project would generate approximately 3,786 ADT, for a net increase from the current zoning of 2,452 ADT. To estimate emissions associated with Project-generated traffic, the CalEEMod model was used to determine the net increase in criteria pollutants. Table 2.2-15, *Additional Operational Emissions of Project Density as Compared to the General Plan Density Allowance*, presents a summary of the net increases in criteria pollutants, which shows that the Proposed Project would cumulatively contribute to the regional air quality. Based on the analysis presented in Section 2.2.2.1, the Proposed Project would be inconsistent with the RAQS and SIP. As a result, there is a significant cumulative operational criteria air quality impact and **the Project's contribution to the significant cumulative air quality impact would be considerable**. **(Impact AQ-3)**

The TIA (LLG 2015) identified 10 intersections that would result in a cumulatively significant decline in level of service:

- E. Barham Drive / S. Twin Oaks Valley Road
- E. Barham Drive / Woodland Parkway
- Nordahl Road / SR 78 Westbound Ramps
- Auto Park Way / Mission Avenue
- Auto Park Way / Country Club Drive
- Valley Parkway / 9th Avenue
- Valley Parkway / Auto Park Way
- Valley Parkway / I-15 SB Ramps
- Valley Parkway / I-15 Northbound Ramps
- Harmony Grove Road / Kauana Loa Drive

Project-generated vehicle trips would increase traffic volumes at roadway intersections in the site vicinity once the Project becomes operational. During periods of near-calm winds, heavily congested intersections can produce elevated levels of CO that could potentially impact nearby sensitive receptors. Therefore, a CO hot spot analysis was conducted to determine whether the Proposed Project would contribute to a violation of the ambient air quality standards for CO at any local intersections.

As stated above, localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles. The *Transportation Project-Level-Carbon Monoxide Protocol* (Caltrans 1998) was followed to determine whether a CO hot spot is likely to form due to Project-generated traffic. In accordance with the Protocol, CO hot spots are typically evaluated when (1) the level of service (LOS) of an intersection decreases to a LOS E or worse; (2) signalization and/or channelization is added to an intersection; and (3) sensitive receptors such as residences, commercial developments, schools, hospitals, etc. are located in the vicinity of the affected intersection. In general, CO hot spots would be anticipated near affected intersections because operation of vehicles in the vicinity of congested intersections involves vehicle stopping and idling for extended periods.

Projects involving traffic impacts may result in the formation of locally high concentrations of CO, known as CO hot spots. To verify that the Proposed Project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO hot spots was conducted.

CALINE4 modeling was conducted for the intersections identified above. Modeling was conducted based on the guidance in Appendix B of the Protocol to calculate maximum predicted 1-hour CO concentrations. As recommended in the Protocol, predicted 1-hour CO concentrations were then scaled to evaluate maximum predicted 8-hour CO concentrations using the recommended scaling factor of 0.7 for urban locations.

Traffic volume inputs to the CALINE4 model were obtained from the TIA (LLG 2015). The *Transportation Project-Level Carbon Monoxide Protocol* requires the modeler to model the top intersections based on the worst LOS and the highest traffic volumes. Some intersections may fall into both the highest traffic volumes and worst LOS categories. The *Transportation Project-Level Carbon Monoxide Protocol* assumed that if the selected intersections do not show an exceedance of the NAAQS, none of the other intersections would either. This conclusion is based on the assumption that these intersections would have the highest CO impacts, and that any intersections with lower traffic volumes and congestion would have lower ambient air quality impacts. As recommended in the Protocol, receptors were located at locations that were approximately 3 meters (10 feet) from the mixing zone, and at a height of 1.8 meters (6 feet). For conservative purposes, emission factors from the EMFAC2011 model for the year 2020 were used in the CALINE4 model (earliest year expected for full occupation of the Project site).

In accordance with the Protocol, it is also necessary to estimate future background CO concentrations in the Project vicinity to determine the potential impact plus background and evaluate the potential for CO hot spots due to the Proposed Project. The existing maximum 1-hour and 8-hour background concentrations of CO that was measured at the Escondido monitoring station of 5.6 and 3.19 ppm were used to represent future maximum background 1-hour and 8-hour CO concentrations. CO concentrations in the future may be lower as inspection and maintenance programs and more stringent emission controls are placed on vehicles.

The CALINE4 model outputs are provided in Appendix E of this report. Table 2.2-16, *CO Hot-Spots Modeling Results Under the Existing Plus Project Plus Cumulative Scenario*, presents a list of the top four intersections with the worst LOS and the highest traffic volumes, and a summary of the predicted CO concentrations (impact plus background) for the intersections evaluated for the Existing plus Cumulative plus Project traffic for the affected intersections. As shown in Table 2.2-16, the predicted CO concentrations would be substantially below the 1-hour and 8-hour NAAQS and CAAQS for CO. Therefore, no exceedances of the CO standard are predicted, and the Proposed Project would not cause or contribute to a violation of the air quality standard. As shown in Table 2.2-16, all impacts, when added to background CO concentrations, would be below the CAAQS for both the 1-hour and 8-hour averaging periods; therefore, **cumulative impacts associated with CO would be less than significant impact**.

2.2.2.4 *Impacts to Sensitive Receptors*

Guidelines for the Determination of Significance

The Proposed Project would have a potentially significant environmental impact if it would:

4. Expose sensitive receptors to substantial pollutant concentrations as follows:

    a. The project places sensitive receptors near CO “hot spots” or creates CO “hot spots” near sensitive receptors.

    b. Project implementation would result in exposure to TACs resulting in a maximum incremental cancer risk greater than one in one million without application of Toxics-Best Available Control Technology (T-BACT) or a health hazard index greater than one.

Guideline Source

Guideline No. 4 is taken from the County Guidelines for Determining Significance - Air Quality (2007c). (The County’s significance thresholds are consistent with the SDAPCD’s Rule 1210 requirements for stationary sources.)

Analysis

Air quality regulators typically define “sensitive receptors” as schools, hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. The County’s definition of “sensitive receptors” also includes residences (County 2007c). Existing sensitive receptors within 0.25 mile of the Proposed Project vicinity include several existing residences to the west, northeast, east and southeast. The closest sensitive receptors are located approximately 10 feet from the Project area. There are approximately 694 residences located within 0.25 mile of the Project site. There are no schools, hospitals, or other non-residence sensitive receptors within 0.25 mile of the Project site. The two primary emissions of concern for impacts to sensitive receptors are CO and diesel particulate matter (DPM). Figure 2.2-1, *Location of Sensitive Receptors,* presents the location of sensitive receptors.

Carbon Monoxide (CO)

CO Hot Spot Analysis

The discussions and results of the CO hot spot analysis were previously mentioned in Subsection 2.2.2.3. As previously presented in Table 2.2-16, all CO impacts, when added to background CO concentrations, would be below the CAAQS for both the 1-hour and 8-hour averaging periods; therefore, the Proposed Project would result in a less than significant impact for CO.

Exposure to TACs with a Health Hazard Risk

Wastewater Treatment and Water Reclamation Facility

TAC emissions would be generated during treatment of the influent at the WTWRF. Most air pollutant emissions would be produced during degradation or reaction while in the treatment system. Organic compounds would volatilize from the liquid surface of the reactors during the biological treatment of influent.

Emission factors of volatile compounds from influent treatment were obtained from the San Joaquin Valley Air Pollution Control District (SJVAPCD; 1993). These are general emission factors expressed in terms of pounds of pollutant emissions per million gallons per day (mgd) of influent. These factors were used to estimate daily emissions of various TACs typically contained in influent waste streams. Emissions of TACs from treatment were estimated for full buildout influent throughput of 0.19 mgd.

A screening-level health risk assessment was performed using the USEPA SCREEN3 model. SCREEN3 uses worst-case meteorological conditions to conservatively estimate ground-level pollutant concentrations downwind of the source. The SCREEN3 results were combined with unit risk factors and reference exposure levels obtained from the CARB to evaluate cancer, chronic non-cancer, and acute health risk. The modeled cancer, chronic non-cancer, and acute non-cancer risks were modeled for each individual compound and the results added to produce a conservative estimate of risk from all compounds.

Diesel-powered emergency generators would be used at the WTWRF for backup power during electric power failures. Emission factors for the generator engines (industrial internal combustion engines) were obtained from the USEPA document *Compilation of Air Pollutant Emission Factors*, commonly known as AP-42 (1996). Annual emissions were calculated based on the annual testing frequency and duration and the power output of the engines. Although the specific engine sizes are not known at this time, representative engine sizes for a 0.19-mgd facility were used to estimate maximum emissions from testing of such engines.

Aqueous hypochlorite would be stored on site and used for the chlorination process. There would be potential for accidental release of such a substance. The facility staff, however, would follow the administrative and engineering requirements of the California Accidental Release Prevention Program. Accordingly, any accidental release of this substance would be contained on site with no offsite runoff, and handlers would be trained in spill reaction. As such, there would be no impact resulting from the storage of this compound at the facility.

TAC emissions from the WTWRF would be produced during reaction or degradation while in the treatment system. Compounds would volatilize from the liquid surface of the reactors during the biological treatment of influent. Total TAC emissions are summarized in Table 2.2-17, *Estimated TAC Emissions from the WTWRF*.

Specific information about emission controls as part of the facility's design is not currently known. It is assumed, however, that sufficient controls would be used to substantially reduce emissions. Tightly covered, well-maintained collection systems can suppress emissions by 95 to 99 percent (USEPA 2012). The types of control technology generally used in reducing TAC emissions from wastewater include steam or air stripping, carbon adsorption, chemical oxidation, membrane separation, liquid-liquid extraction and biotreatment (aerobic or anaerobic) (USEPA 2012). As shown in Table 2.2-17, the total TAC emissions of criteria pollutants from operation of the WTWRF are below the SDAPCD thresholds of significance. Accordingly, **impacts to air quality from the proposed WTWRF would be less than significant**.

Construction-related Diesel Health Risk

DPM emissions would be released from the on-site construction equipment and from haul trucks associated with the Proposed Project. The CARB has declared that DPM from diesel engine exhaust is a TAC. Additionally, the OEHHA has determined that chronic exposure to DPM can cause carcinogenic and non-carcinogenic health effects.

The USEPA SCREEN3 model, the screening air dispersion modeling method approved by the CARB for such assessments, was used to estimate concentrations of DPM from construction of the Proposed Project. The DPM construction equipment emissions were estimated from emission calculation and amount to 1.78 lbs/day of DPM (as PM_{10} exhaust). The emissions were represented in the model as an area source equal to the size of the Project's construction area (based on the number of residential units which is up to 25 acres for each Neighborhood, not including the open space areas). An emission release height of 10 feet (3 meters) also was assumed. Receptor locations where construction impacts were calculated focused on the residential receptors located west and northeast of the Project site.

Exposures to TACs such as DPM can also cause chronic (long-term) and acute (short-term) related non-cancer illnesses such as reproductive effects, respiratory effects, eye sensitivity, immune effects, kidney effects, blood effects, central nervous system effects, birth defects, or other adverse environmental effects. Risk characterization for non-cancer health risks is expressed as an HI. The HI is a ratio of the predicted concentration of a project's emissions to a concentration considered acceptable to public health professionals, termed the REL.

DPM has effects on the respiratory system, which accounts for essentially all of the potential chronic non-cancer hazards from DPM. Therefore, the only HI calculated was for the respiratory system.

Table 2.2-18, *Construction Health Risk Assessment Results*, provides the results of the construction health risk assessment for Proposed Project construction along with the County's Guidelines for Determining Significance health risk thresholds. As shown in Table 2.2-18, the construction emissions would not exceed the County's Guidelines for Determining Significance health risk thresholds for cancer risk and chronic non-cancer hazard.

Diesel exhaust particulate matter is known in the state of California to contain carcinogenic compounds. The risks associated with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure (i.e., 24 hours per day, seven days per week, 365 days per year for 70 years). Because the Project-related construction emissions of diesel exhaust would occur for less than four years, the Proposed Project would not result in long-term chronic lifetime exposure to diesel exhaust from heavy duty diesel equipment. Therefore, **air quality impacts related to exposure of sensitive receptors to substantial pollutant concentrations would be less than significant**.

Construction-related Silica Risk

Silica risk is primarily associated with rock crushing. Since Project construction does not propose any rock crushing on-site, significant crystalize silica emissions would not be generated on-site.

Operation-related Health Risk

Residential development projects do not typically generate any TAC emissions. Therefore, **operational impacts of the land use in relation to generation of TACs would be less than significant**.

WTWRF treatment of influent would produce emissions of TACs during reaction or degradation. The annual emissions of TACs from WTWRF are summarized in Table 2.2-19, *WTWRF Health Risk Assessment Results*. A screening health risk assessment was prepared to analyze cancer, chronic non-cancer and acute non-cancer health risks from the facility. The cancer risk is calculated by multiplying the annual average concentrations calculated using the SCREEN3 model and the inhalation cancer unit risk and cancer potency factors for the five identified TAC compounds (i.e., benzene, chloroform, ethyl benzene, methylene chlorine, 1,4-dichlorobenzene and TCE) through OEHHA's Technical Support Document updated in 2011. The non-cancer chronic and acute risks are calculated by dividing the REL values to the 24-hour average concentrations for each TAC compound. The location of maximum impact was modeled at 400 feet from the property boundary of the WTWRF study area. At this location, the modeled cancer risk is 0.027 in 1 million, the chronic non-cancer inhalation hazard index is less than 1, and the acute non-cancer inhalation hazard index is less than 1. These results are less than the SDAPCD standards discussed previously. Therefore, **the increased health risk impacts from the proposed WTWRF would be less than significant**.

2.2.2.5 *Odor Impacts*

<u>Guidelines for the Determination of Significance</u>

The Proposed Project would have a potentially significant environmental impact if it would:

5. Generate objectionable odors or place sensitive receptors next to existing objectionable odors that would affect a considerable number of persons or the public.

Guideline Source

Guideline No. 5 is taken from the County Guidelines for Determining Significance - Air Quality (2007c).

<u>Analysis</u>

Project Construction

Proposed Project construction could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. Diesel exhaust and VOCs will be emitted during construction of the Proposed Project, which are objectionable to some; however, emissions will disperse rapidly from the Project site and therefore should not be at a level to induce a negative response. Because the construction equipment would be operating at various locations throughout the construction site, and because any operation that would occur in the vicinity of existing receptors would be temporary, **impacts associated with odors during construction would be less than significant**.

Project Operations

Odors from Equestrian Uses

Neighborhoods 3 and 5 would allow horse keeping on many of the lots and some members of the public associate objectionable odors with horses. Private ownership of horses located on larger lots; however, would not be considered a substantial odor source.

In addition, there is the existing Harmony Grove Equestrian Center located on the southeastern side of the Proposed Project site, approximately 400 feet west of the existing residences to the east of the Project site and 500 feet west of the proposed residences in Neighborhood 5. This equestrian facility would be retained, open to the public and privately maintained. Portions of the existing equestrian training and boarding facility would accommodate private horse boarding; however, the distance to existing and planned residences is great enough such that any odors generated by the facility would sufficiently dissipate before reaching said residences. Therefore, **impacts due to odors from the equestrian uses on the** Proposed **Project site would be less than significant**.

Odors from WTWRF

Operation of the WTWRF has the potential to result in odor impacts because of the nature of the activities at the proposed facility. The frequency with which the facility would expose the public to objectionable odors would be minimal, however, based on the control measures planned in the design. All WTWRF facilities with the exception of the wet weather pond would be covered to avoid uncontrolled odor release. Section 6318 of the San Diego County Zoning Ordinance states that "All commercial and industrial uses shall be so operated as not to emit matter causing unpleasant odors which are perceptible by the average person at or beyond any lot line of the lot containing said uses." Additionally, Section 6318 requires that odors be diluted by "a ratio of one volume of odorous air to eight or more volumes of clean air." Active odor control units would be located to manage gases from the wet and solids stream treatment processes. All processes and equipment would be housed (or otherwise contained), and ventilation would be controlled such that no objectionable odors would be discernible at the Project site boundaries.

Odors are typically associated with particular steps in the wastewater treatment process. Initially, raw wastewater is transferred to the primary clarifiers where most solids are separated from the liquid portion of wastewater in the treatment process. A ferrous chloride solution is added to the raw wastewater before it enters the primary clarifiers to reduce odors at that treatment stage. Ferrous chloride molecules capture hydrogen sulfide molecules, forming insoluble compounds that precipitate out of the waste stream.

Wastewater undergoing aerobic digestion (decomposition with free oxygen) in the aeration basins emits a characteristically musty odor due to the particular type of biogases released in the process. A misting system with odor neutralizing liquids breaks down the foul smelling chemical compounds in the biogases. Chlorine gas is used to disinfect the non-potable water, which is used daily to wash down all areas of the plant.

Bio filters remove odor by capturing the odor causing compounds in a media bed where they are oxidized by naturally occurring micro-organisms. Wastewater operators routinely check the digester pressure relief valves to make sure they are not venting to the outdoors and that the waste gas burner is performing optimally.

Facilities that cause nuisance odors are subject to enforcement action by the SDAPCD. The SDAPCD responds to odor complaints by investigating the complaint determining whether the odor violated SDAPCD Rule 51. The inspector will take enforcement action if the source is not in compliance with SDAPCD rules and regulations and will inform the complainant of investigation results. In the event of enforcement action, odor-causing impacts must be mitigated by appropriate means to reduce the impacts to sensitive receptors to less than significant. Such means include shutdown of odor sources or requirements to control odors using add-on equipment.

The odor control design for the facility would be such that no substantial offensive odors would be detected by nearby residences or other sensitive receptors. Additionally, disposal of biosolids at landfill sites could also contribute to odors and increase air emissions at these end-use facilities. Only sites that have addressed all site-specific impacts would be used, however, and **odor-related impacts from the proposed WTWRF would therefore be less than significant**.

Odors from Sewer Pump Station

The proposed sewer pump station system is designed to pump out wastewater several times per hour. The system would be equipped with two redundant pumps that would allow for backup operation of the pumps in the event that one pump is out of service. The wastewater system would also include chemical feed addition at the pump station to minimize odors. A back-up chemical injection system would be included for further odor control redundancy. Therefore, **impacts from sewer pump station odors would be less than significant**.

2.2.3 Cumulative Impact Analysis

With regard to past and present projects, the background ambient air quality, as measured at the monitoring stations maintained and operated by the SDAPCD, measures the concentrations of pollutants from existing sources. Past and present project impacts are, therefore, included in the background ambient air quality data. The cumulative projects used in the air quality analysis are the same 44 projects presented in the TIA (LLG 2015). For the purpose of nonattainment pollutants, the cumulative study area would be the entire air basin; however, contributions from individual projects on basin-wide nonattainment pollutants cannot be determined through modeling analyses. The screening distance for odors is one mile (Sacramento Metropolitan Air Quality Management District [SMAQMD] 2009).

In analyzing cumulative impacts for air quality, specific evaluation must occur regarding a project's contribution to the cumulative increase in pollutants for which the SDAB is listed as "non-attainment" for the CAAQS and/or NAAQS. A project that has a significant impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NO_X and/or VOCs, as determined by the screening criteria outlined above, would have a significant cumulative effect. In the event direct impacts from the project are less than significant, a project still may 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 screening levels identified above. The text below addresses each of the thresholds relative to cumulative contribution.

Cumulative growth would not be within the range projected by SANDAG, as the Proposed Project was found to not be consistent with the RAQS and SIP. Growth projected for the Proposed Project would result in a cumulatively considerable contribution and **these cumulative impacts would be significant**. **(Impact AQ-4)**

The planned or reasonably foreseeable projects were accounted for in the TIA (LLG 2015). As such, cumulative projects were considered in the evaluation of CO hot spots. Based on the CO hot spots evaluation, **cumulative impacts associated with CO hot spots would be less than significant**.

As discussed in Section 2.2.2.3, the SDAB has been designated as a federal nonattainment area for ozone, and a state nonattainment area for ozone, PM_{10} and $PM_{2.5}$; therefore, a regional cumulative impact currently exists for ozone precursors and PM_{10} and $PM_{2.5}$. Although Proposed Project emissions for all criteria pollutants would be below the significance threshold, it is possible that construction associated with several other projects in the general vicinity of the Proposed Project would occur at the same time, and cumulative construction projects would result in a significant cumulative impact for VOC, NO_X, PM_{10} and $PM_{2.5}$ The **Proposed** Project would result in a cumulatively considerable net increase in criteria pollutants during construction and impacts would be significant. (Impact AQ-2)

Also as discussed in Section 2.2.2.3, the Proposed Project would be inconsistent with the RAQS and SIP. As a result, there is a significant cumulative operational criteria air quality impact and the Project's contribution to the significant cumulative air quality impact would be considerable. (Impact AQ-3)

The effects of objectionable odors would be localized to the immediate surrounding area and would not contribute to a cumulatively considerable odor. The list of past, present and future projects within the surrounding area were evaluated and the only potential objectionable odors would be from the Harmony Grove Village project, which includes a wastewater treatment plant and equestrian facilities. These potential odor sources, however, were determined to be less than significant to surrounding uses (County 2006a). Accordingly, contributions to odor impacts would not be considerable and impacts would be **less than significant**.

2.2.4 Significance of Impacts Prior to Mitigation

The following significant impacts related to air quality would occur under Proposed Project implementation:

Impact AQ-1 The Proposed Project is proposing an increase in housing units beyond what was included for the site in the 2009 RAQS; therefore, impacts associated with conformance to regional air quality plans would be potentially significant.

Impact AQ-2 Construction of the Proposed Project and other projects that occur in the general vicinity of the Project would result in a cumulatively considerable net increase in VOC, NO_X, PM_{10} and $PM_{2.5}$.

Impact AQ-3 Operation of the Proposed Project would result in net increases in criteria pollutants, which would result in a cumulatively considerable contribution in criteria pollutants to the regional air quality.

Impact AQ-4 Cumulative growth would not be within the range projected by SANDAG, as the Proposed Project was found to not be consistent with the 2009 RAQS and SIP. Growth projected for the Proposed Project would result in a cumulatively considerable contribution.

2.2.5 Mitigation

Measures to reduce construction dust emissions are required by the SDAPCD Rule 55 – Fugitive Dust Control and, as listed in Table 1-4, are included as Project Design Features for the Proposed Project. The listed measures constitute BMPs for dust control, diesel particulates and construction equipment emissions. The Project would utilize EPA certified construction equipment with Tier 4 engines for all construction activities. Construction equipment would use low-sulfur fuels. Further, although Project construction emissions do not exceed screening level thresholds, the Project would incorporate all measures specified in Mitigation Measure Air-2.5 of the San Diego County General Plan Update Final EIR. With the implementation of the fugitive dust control measures and use of Tier 4 construction equipment, the Project construction impacts alone are less than significant.

The following mitigation measure is required for Impacts AQ-1 and AQ-4.

M-AQ-1 The County shall provide a revised housing forecast to SANDAG to ensure that any revisions to the population and employment projections used in updating the RAQS and SIP will accurately reflect anticipated growth due to the Proposed Project.

In addition, the Proposed Project would significantly contribute to cumulative construction and operational air quality impacts (Impacts AQ-2 and AQ-3, respectively). The Proposed Project has been designed to include electric vehicle charging stations, efficiency measures to reduce energy and water consumption, and exceed the 2008 Title 24 standards by 15 percent. Because the Proposed Project would be inconsistent with the RAQS and SIP, however, short of reducing the Project size, there are no feasible mitigation measures to reduce the Project's contribution to a less than considerable level.

As described in Table 1-4, the Proposed Project would implement a number of additional Project Design Features that would reduce emissions of criteria air pollutants during operation. These include prohibiting wood-burning fireplaces, and providing educational materials (such as brochures) with information regarding the use of low-VOC paints and consumer products in every residence.

Odor control measures are also included as Project Design Features in order to minimize objectionable odors. Some of these measures include covering all WTWRF facilities, housing/containing all processes and equipment, utilizing biofilters, and performing routine inspections of the digester pressure relief valves to make sure they are not venting to the outdoors and that the waste gas burner is performing optimally.

As shown above, the Proposed Project has incorporated as many measures as feasible, short of reducing the Project size. There are no additional measures available to reduce these significant cumulative impacts.

2.2.6 Conclusion

Implementation of the Proposed Project would conflict with the current RAQS and SIP because the density proposed is not consistent with current General Plan and SANDAG housing forecasts (Impacts AQ-1 and AQ-4). This represents a significant impact. M-AQ-1 requires that the County provide a revised housing forecast to SANDAG to ensure any revisions to the population and employment projects. The provision of housing information would assist SANDAG in revising the housing forecast: however, until the anticipated growth is included in the emission estimates of the RAQS and the SIP, the direct and cumulative impacts (Impacts AQ-1 and AQ-4) would remain significant and unmitigable.

In addition, the Proposed Project would significantly contribute to cumulative construction and operational air quality impacts (Impacts AQ-2 and AQ-3, respectively). The Proposed Project has been designed to include electric vehicle charging stations, efficiency measures to reduce energy and water consumption, and exceed the 2008 Title 24 standards by 15 percent. These Project Design Features have reduced the Proposed Project's daily emissions; however, because the Proposed Project would be inconsistent with the RAQS and SIP, short of reducing the Project size, there are no feasible mitigation measures to reduce the Project's contribution to a less than considerable level. Accordingly, these impacts would remain significant and unmitigated.

Table 2.2-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone	1-Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.070 ppm (137 $\mu g/m^3$)		0.075 ppm (147 $\mu g/m^3$)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		-		
Fine Particulate Matter ($PM_{2.5}$)[8]	24-Hour	-	-	35 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	12 $\mu g/m^3$		
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3	-	Non-Dispersive Infrared Photometry (NDIR)
	8-Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	-	
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		-	-	-
Nitrogen Dioxide (NO_2)[9]	1-Hour	0.18 ppm (339 $\mu g/m^3$)	Gas Phase Chemiluminescence	0.100 ppm (188 $\mu g/m^3$)	-	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)		0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1-Hour	0.25 ppm (655 $\mu g/m^3$)	Ultraviolet Fluorescence	75 ppb (196 $\mu g/m^3$))	-	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3-Hour	-		-	0.5 ppm (1300 $\mu g/m^3$)	
	24-Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (365 $\mu g/m^3$) (for certain areas)[9]	-	
	Annual Arithmetic Mean	-		0.030 ppm (80 $\mu g/m^3$) (for certain areas)[9]	-	
Lead[11,12]	30-Day Average	1.5 $\mu g/m^3$	Atomic Absorption	-	-	-
	Calendar Quarter	-		1.5 $\mu g/m^3$	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	-		0.15 $\mu g/m^3$		
Visibility Reducing Particles[13]	8-Hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	**No Federal Standards**		
Sulfates	24-Hour	25 $\mu g/m^3$	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24-Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chromatography			

Notes for Table 2.2-1

1 California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended 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 ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.

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 procedure which can be shown to the satisfaction of the CARB 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 USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.

8 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 PM_{10} 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 three years.

9 To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 and 0.100 ppm, respectively.

10 On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971standards remain in effect until implementation plans to attain or maintain the 2010 standards have are approved.

11 The 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.

12 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 one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

13 In 1989, the CARB converted both the general statewide 10-mile visibility standards and the Lake Tahoe 20-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.

Source: CARB June 4, 2013
ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter

Table 2.2-2
FEDERAL AND STATE AIR QUALITY DESIGNATIONS

Criteria Pollutant	Federal Designation	State Designation
O_3 (1-hour)	(No federal standard)	Nonattainment
O_3 (8-hour)	Nonattainment	Nonattainment
CO	Maintenance	Attainment
PM_{10}	Unclassifiable	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(No federal standard)	Attainment
Hydrogen Sulfide	(No federal standard)	Unclassifiable
Visibility	(No federal standard)	Unclassifiable

Source: SDAPCD 2012

Table 2.2-3
AMBIENT BACKGROUND CONCENTRATIONS AT
SAN DIEGO MONITORING STATIONS

Air Pollutant	2009	2010	2011	2012	2013
Ozone – Escondido East Valley Parkway					
Max 1-Hour (ppm)	0.093	0.105	0.098	0.084	0.084
Days > CAAQS (0.09 ppm)	0	2	1	0	0
Max 8-Hour (ppm)	0.080	0.084	0.089	0.074	0.075
Days > NAAQS (0.075 ppm)	1	3	2	0	0
Days > CAAQS (0.070 ppm)	9	5	2	2	4
Particulate Matter (PM_{10}) – Escondido East Valley Parkway					
Max Daily (µg/m^3)	73	42	40	33	82
Days > NAAQS (150 µg/m^3)	0	0	0	0	0
Days > CAAQS (50 µg/m^3)	1	0	0	0	1
Highest Annual Average (µg/m^3)	24.9	20.9	18.8	18.1	23.1
Exceed CAAQS (20 µg/m^3)	1	1	0	0	1
Particulate Matter ($PM_{2.5}$) – Escondido East Valley Parkway					
Max Daily (µg/m^3)	64.9	33.3	27.4	70.7	56.3
Days > NAAQS (35 µg/m^3)	2	0	0	1	1
Highest Annual Average (µg/m^3)	13.4	10.5	11.5	10.5	11.0
Exceed NAAQS (15 µg/m^3)	0	0	0	0	0
Exceed CAAQS (12 µg/m^3)	1	0	0	0	0
Nitrogen Dioxide (NO_2) – Escondido East Valley Parkway					
Max 1-Hour (ppm)	0.073	0.064	0.062	0.062	0.061
Days > NAAQS (0.10 ppm)	0	0	0	0	0
Days > CAAQS (0.18 ppm)	0	0	0	0	0
Highest Annual Average (ppm)	0.016	0.014	0.013	0.013	0.013
Exceed NAAQS (0.053 ppm)	0	0	0	0	0
Exceed CAAQS (0.030 ppm)	0	0	0	0	0

Table 2.2-3 (cont.)
AMBIENT BACKGROUND CONCENTRATIONS AT SAN DIEGO MONITORING STATIONS

Air Pollutant	2009	2010	2011		
Carbon Monoxide (CO) – Escondido East Valley Parkway					
Max 8-Hour (ppm)	3.24	2.46	2.20	3.61	
Days > NAAQS (9 ppm)	0	0	0	0	-
Days > CAAQS (9.0 ppm)	0	0	0	0	
Max 1-Hour (ppm)	4.4	3.9	3.5	4.4	3.2
Days > NAAQS (35 ppm)	0	0	0	0	0
Days > CAAQS (20 ppm)	0	0	0	0	0
Sulfur Dioxide (SO_2) – Downtown San Diego Beardsley Street					
Max Daily Measurement (ppm)	0.006	0.002	0.003		
Days > NAAQS (0.14 ppm)	0	0	0	-	-
Days > CAAQS (0.04 ppm)	0	0	0		

Source: www.arb.ca.gov (all pollutants except 1-hour CO) and http://www.epa.gov/airdata (1-hour CO)
Abbreviations: > = exceed; ppm = parts per million; µg/m^3 = micrograms per cubic meter; CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard

Table 2.2-4
SCREENING-LEVEL THRESHOLDS FOR AIR QUALITY IMPACT ANALYSIS

Construction Emissions			
Pollutant	**lbs/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 (VOCs)	75		
Operational Emissions			
Pollutant	**lbs/hour**	**lbs/day**	**Tons 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
Oxides of Sulfur (SO_X)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	---	3.2	0.6
Volatile Organic Compounds (VOCs)	---	75	13.7
Toxic Air Contaminant Emissions			
Excess Cancer Risk	1 in 1 million 10 in 1 million with T-BACT		
Non-cancer Hazard	1.0		

Source: SDACPD Rule 20.2 and Rule 1210

Table 2.2-5
EQUIPMENT REQUIREMENTS FOR CONSTRUCTION OF THE PROPOSED PROJECT

Off-road Equipment Type	Horsepower	Site Preparation and Grading		Backbone Infrastructure		Building Construction		Paving		Architectural Coatings	
		Pieces	Hours	Pieces	Hours	Pieces	Hours	Pieces	Hours	Pieces	Hours
Air Compressors	78	-	-	-	-	-	-	-	-	1	6
Cranes	226	-	-	-	-	4	7	-	-	-	-
Excavators	162	2	8	-	-	-	-	-	-	-	-
Forklifts	89	-	-	1	8	12	8	-	-	-	-
Generator Sets	84	-	-	-	-	4	8	-	-	-	-
Graders	174	1	8	-	-	-	-	-	-	-	-
Off-Highway Trucks	400	-	-	2	8	-	-	-	-	-	-
Other Material Handling Equipment	167	-	-	1	8	-	-	-	-	-	-
Pavers	125	-	-	-	-	-	-	2	8	-	-
Paving Equipment	130	-	-	-	-	-	-	2	8	-	-
Rollers	80	-	-	-	-	-	-	2	8	-	-
Rubber Tired Dozers	255	4	8	-	-	-	-	-	-	-	-
Rubber Tired Loaders	200	-	-	-	-	-	-	-	-	-	-
Scrapers	361	2	8	-	-	-	-	-	-	-	-
Skid Steer Loaders	65	-	-	-	-	-	-	-	-	-	-
Sweepers/Scrubbers	64	-	-	-	-	-	-	-	-	-	-
Tractors/Loaders/Backhoes	97	6	8	1	8	12	7	-	-	-	-
Trenchers	80	-	-	1	8	-	-	-	-	-	-
Welders	46	-	-	-	-	4	8	-	-	-	-

Source: HELIX 2015b
Note: Neighborhood construction would require different amounts of equipment to complete construction within the scheduled timing. To remain conservative, the component with the highest number of equipment needed was used for this table.

Table 2.2-6
ESTIMATED 2016 WORST-CASE CONSTRUCTION EMISSIONS – BY OVERLAPPING CONSTRUCTION ACTIVITIES

Overlapping Construction Activities	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	lbs/day					
Overlap 1						
Grading (N 1 & 5)	1	3	36	<1	9	5
Daily Maximum Total	**1**	**3**	**36**	**<1**	**9**	**5**
Overlap 2						
Grading (N 2)	1	3	36	<1	8	5
Drilling and Blasting (N 2)	<1	21	84	3	2	<1
Backbone Infrastructure (N 1 & 5)	1	2	23	<1	<1	<1
WTWRF Construction	25	3	11	<1	1	<1
Daily Maximum Total	**26**	**29**	**153**	**3**	**12**	**5**
Overlap 3						
Backbone Infrastructure (N 1 & 5)	1	2	23	<1	<1	<1
WTWRF Construction	25	3	11	<1	1	<1
Daily Maximum Total	**26**	**5**	**34**	**<1**	**1**	**<1**
Overlap 4						
WTWRF Construction	25	3	11	<1	1	<1
Vertical Building (N 1 & 5)	2	9	77	<1	1	<1
Daily Maximum Total	**27**	**13**	**87**	**<1**	**2**	**<1**
Significant Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. USEPA Tier 4 off-Road equipment and diesel particulate filters were assumed to be utilized.
3. Fugitive dust measures were applied to control PM_{10} and $PM_{2.5}$ dust emissions.
4. N = Neighborhood

Table 2.2-7
ESTIMATED 2017 WORST-CASE CONSTRUCTION EMISSIONS –
BY OVERLAPPING CONSTRUCTION ACTIVITIES

Overlapping Construction Activities	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	lbs/day					
Overlap 1						
Grading (N 3)	1	3	36	<1	8	5
Drilling and Blasting (N 3)	<1	21	84	3	2	<1
Backbone Infrastructure (N 2 & 3)	1	2	23	<1	<1	<1
Road Construction	4	44	18	<1	9	3
Vertical Building (N 1 & 5)	27	9	78	<1	1	<1
Daily Maximum Total	**32**	**79**	**238**	**3**	**21**	**8**
Overlap 2						
Backbone Infrastructure (N 2 & 3)	1	2	23	<1	<1	<1
Vertical Building (N 1 & 5)	27	9	78	<1	1	<1
Daily Maximum Total	**27**	**11**	**101**	**<1**	**1**	**<1**
Overlap 3						
Grading (N 4)	1	3	36	<1	8	5
Drilling and Blasting (N 4)	<1	21	84	3	2	<1
Vertical Building (N 1 & 5)	27	9	78	<1	1	<1
Daily Maximum Total	**27**	**33**	**198**	**3**	**12**	**5**
Significant Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. USEPA Tier 4 off-Road equipment and diesel particulate filters were assumed to be utilized.
3. Fugitive dust measures were applied to control PM_{10} and $PM_{2.5}$ dust emissions.
4. N = Neighborhood

Table 2.2-8
ESTIMATED 2018 WORST-CASE CONSTRUCTION EMISSIONS – BY OVERLAPPING CONSTRUCTION ACTIVITIES

Overlapping Construction Activities	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	lbs/day					
Overlap 1						
Backbone Infrastructure (N 4)	1	2	23	<1	<1	<1
Vertical Building (N 2)	26	9	90	<1	<1	<1
Daily Maximum Total	**27**	**11**	**113**	**<1**	**1**	**<1**
Overlap 2						
Backbone Infrastructure (N 4)	1	2	23	<1	<1	<1
Vertical Building (N 3)	15	6	56	<1	1	<1
Daily Maximum Total	**16**	**8**	**79**	**<1**	**1**	**<1**
Significant Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. USEPA Tier 4 off-Road equipment and diesel particulate filters were assumed to be utilized.
3. Fugitive dust measures were applied to control PM_{10} and $PM_{2.5}$ dust emissions.
4. N = Neighborhood

Table 2.2-9
ESTIMATED 2019 WORST-CASE CONSTRUCTION EMISSIONS

Construction Activities (No Overlap)	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	lbs/day					
Vertical Building (N 4)	41	9	77	<1	1	<1
Daily Maximum Total	**41**	**9**	**77**	**<1**	**1**	**<1**
Significant Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. USEPA Tier 4 off-Road equipment and diesel particulate filters were assumed to be utilized.
3. Fugitive dust measures were applied to control PM_{10} and $PM_{2.5}$ dust emissions.
4. N = Neighborhood

Table 2.2-10
OPERATIONAL EMISSIONS IN 2018 (lbs/day)

Category	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Neighborhoods 1 and 5						
Area	9	<1	14	<1	<1	<1
Energy	<1	1	<1	<1	<1	<1
Mobile	6	14	66	<1	11	3
Off-road Equipment	1	8	7	<1	1	1
TOTAL	**17**	**24**	**87**	**<1**	**12**	**4**
Screening-level Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. Operational emissions associated with the WTWRF are included in the Proposed Project emissions. Off-road emissions consist of two generators (one associated with the WTWRF and one associated with the Fire Pump Station).

Table 2.2-11
OPERATIONAL EMISSIONS IN 2019 (lbs/day)

Category	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Neighborhoods 1 through 3, and 5						
Area	14	<1	21	<1	<1	<1
Energy	<1	2	1	<1	<1	<1
Mobile	10	22	102	<1	19	5
Off-road Equipment	1	8	7	<1	1	1
TOTAL	**25**	**32**	**132**	**<1**	**20**	**6**
Screening-level Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. Operational emissions associated with the WTWRF are included in the Proposed Project emissions. Off-road emissions consist of two generators (one associated with the WTWRF and one associated with the Fire Pump Station).

Table 2.2-12
OPERATIONAL EMISSIONS IN 2020 (lbs/day)

Category	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Neighborhoods 1 through 5						
Area	20	<1	28	<1	1	1
Energy	<1	2	1	<1	<1	<1
Mobile	12	25	121	<1	23	6
Off-road Equipment	1	8	7	<1	1	1
Total	**33**	**36**	**157**	**<1**	**25**	**8**
Screening-level Thresholds	75	250	550	250	100	55
Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. Operational emissions associated with the WTWRF are included in the Proposed Project emissions. Off-road emissions consist of two generators (one associated with the WTWRF and one associated with the Fire Pump Station).

Table 2.2-13
WORST-CASE 2018 DAILY EMISSIONS – CONCURRENT OPERATION AND CONSTRUCTION (lbs/day)

Neighborhood	Phase	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
1 & 5	Operation	17	24	87	<1	12	4
2	Construction (Vertical Building)	26	9	90	<1	<1	<1
4	Construction (Backbone Infrastructure)	1	2	23	<1	<1	<1
TOTAL		**44**	**35**	**200**	**<1**	**13**	**4**
Screening-level Thresholds		75	250	550	250	100	55
Exceedance?		No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Peak Daily Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. Total for Peak Daily Operational Emissions includes Area, Energy, Mobile, and Off-road Equipment sources.

Table 2.2-14
WORST-CASE 2019 DAILY EMISSIONS – CONCURRENT OPERATION AND CONSTRUCTION (lbs/day)

Neighborhood	Phase	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
1, 2, 3 & 5	Operation	25	32	132	<1	20	6
4	Construction (Vertical Building)	41	9	77	<1	1	<1
	TOTAL	**66**	**41**	**209**	**<1**	**21**	**7**
	Screening-level Thresholds	75	250	550	250	100	55
	Exceedance?	No	No	No	No	No	No

Source: HELIX 2015b
Notes:
1. Peak Daily Emissions were calculated for both summer and winter months, and the highest value is shown here.
2. Total for Peak Daily Operational Emissions includes Area, Energy, Mobile, and Off-road Equipment sources.

Table 2.2-15
ADDITIONAL OPERATIONAL EMISSIONS OF PROJECT DENSITY AS COMPARED TO THE GENERAL PLAN DENSITY ALLOWANCE (lbs/day)

Category	VOC	NO_X	PM_{10}	$PM_{2.5}$
Area	7	<1	<1	<1
Energy	<1	1	<1	<1
Mobile	4	9	8	2
TOTAL	**11**	**10**	**8**	**3**

Source: HELIX 2015b
Note: Emissions were calculated for both summer and winter months, and the highest value is shown here.

Table 2.2-16
CO HOT SPOTS MODELING RESULTS UNDER THE EXISTING PLUS PROJECT PLUS CUMULATIVE SCENARIO

Intersection	Maximum 1-hour CO Concentration plus Background (ppm)		Maximum 8-hour CO Concentration plus Background (ppm)
	AM	PM	
E. Barham Drive/S. Twin Oaks Valley Road	7.9	8.5	5.2
Auto Park Way/Mission Avenue	7.5	7.7	4.7
Valley Pkwy / 9th Avenue	7.1	7.1	4.2
Valley Pkwy / I-15 SB Ramps	7.2	7.2	4.3
CAAQS Standard	20	20	9.0
Exceed CAAQS Standard?	*No*	*No*	*No*

Source: HELIX 2015b
Notes:
1. Peak hour traffic volumes are based on the TIA prepared for the Proposed Project by LLG (2015).
2. Highest five years SDAPCD (2007-2011) 1-hour ambient background concentration (5.6 ppm) + 2020 modeled CO 1-hour contribution.
3. Highest five years SDAPCD 8-hour ambient background concentration (3.19 ppm) multiply by 1-hour/8-hour conversion factor of 0.7 and then add the 2020 modeled CO 8-hour contribution.

Table 2.2-17
ESTIMATED TAC EMISSIONS FROM THE WTWRF

Compound	Peak Daily Emissions (lbs/day)
Ammonia	4.765×10^{-5}
Benzene	9.227×10^{-8}
Chloroform	1.289×10^{-6}
Ethyl benzene	3.58×10^{-7}
Hydrogen sulfide	3.102×10^{-6}
1,1,1-TCA	4.216×10^{-7}
Methylene chlorine	1.241×10^{-6}
1,4-Dichlorobenzene	7.398×10^{-7}
Phenol	1.559×10^{-6}
Styrene	7.955×10^{-7}
Toluene	7.796×10^{-7}
TCE	4.136×10^{-7}
Xylene	9.323×10^{-7}
TOTAL VOC EMISSIONS	**5.937×10^{-5} (or 0.00005937)**

Table 2.2-18
CONSTRUCTION HEALTH RISK ASSESSMENT RESULTS

Metric	Dispersion Model Estimate[1]	District's Significance Threshold	Exceeds Threshold?
Cancer risk[2]	0.008 in 1 million	1 in 1 million	No
Chronic non-cancer HI from DPM[3]	0.012	1.0	No

Source: HELIX 2015b
[1] Computed at the nearest sensitive receptor located approximately 10 meters (roughly 33 feet) west of the Proposed Project boundary.
[2] Assumes an exposure frequency of 260 days, exposure duration of 4.0 years, and an age sensitivity factor of 1.
[3] Assumes a chronic DPM reference exposure level of 5 μg/m^3.

Table 2.2-19
WTWRF HEALTH RISK ASSESSMENT RESULTS

Compound	Annual Average Emissions (lbs/year)	Annual Ambient Conc. (μg/m^3)	Cancer Risk	Chronic Non-cancer Risk	24-hr (Acute) Non-cancer Risk
Ammonia	0.006934	1.49×10^{-7}	-	2.99×10^{-10}	1.87×10^{-11}
Benzene	1.34×10^{-5}	2.89×10^{-10}	3.49×10^{-9}	1.93×10^{-12}	8.90×10^{-14}
Chloroform	0.000188	4.04×10^{-9}	9.27×10^{-9}	5.39×10^{-12}	1.08×10^{-11}
Ethyl benzene	5.21×10^{-5}	1.12×10^{-9}	1.18×10^{-9}	2.24×10^{-13}	-
Hydrogen sulfide	0.000451	9.73×10^{-9}	-	3.89×10^{-10}	9.26×10^{-11}
1,1,1-TCA	6.14×10^{-5}	1.32×10^{-9}	-	5.29×10^{-13}	7.78×10^{-15}
Methylene chlorine	0.000181	3.89×10^{-9}	1.64×10^{-9}	3.89×10^{-12}	1.11×10^{-13}
1,4-Dichlorobenzene	0.000108	2.32×10^{-9}	1.12×10^{-8}	1.16×10^{-12}	-
Phenol	0.000227	4.89×10^{-9}	-	9.78×10^{-12}	3.37×10^{-13}
Styrene	0.000116	2.49×10^{-9}	-	1.11×10^{-12}	4.75×10^{-14}
Toluene	0.000113	2.44×10^{-9}	-	3.26×10^{-12}	2.64×10^{-14}
TCE	6.02×10^{-5}	1.30×10^{-9}	1.10×10^{-9}	8.65×10^{-13}	-
Xylene	0.000136	2.92×10^{-9}	-	1.67×10^{-12}	5.31×10^{-14}
TOTAL	**0.008641**	**-**	**0.027×10^{-6}**	**<1**	**<1**

Sources: HELIX 2015b
Notes:
1. Assumed hydrogen sulfide would be controlled to 90 percent efficiency with scrubbers or biofilters that are part of the odor control system.
2. Cancer risk less than 10 in 1 million is considered less than significant.
3. Chronic and acute non-cancer risks less than 1 are considered less than significant.

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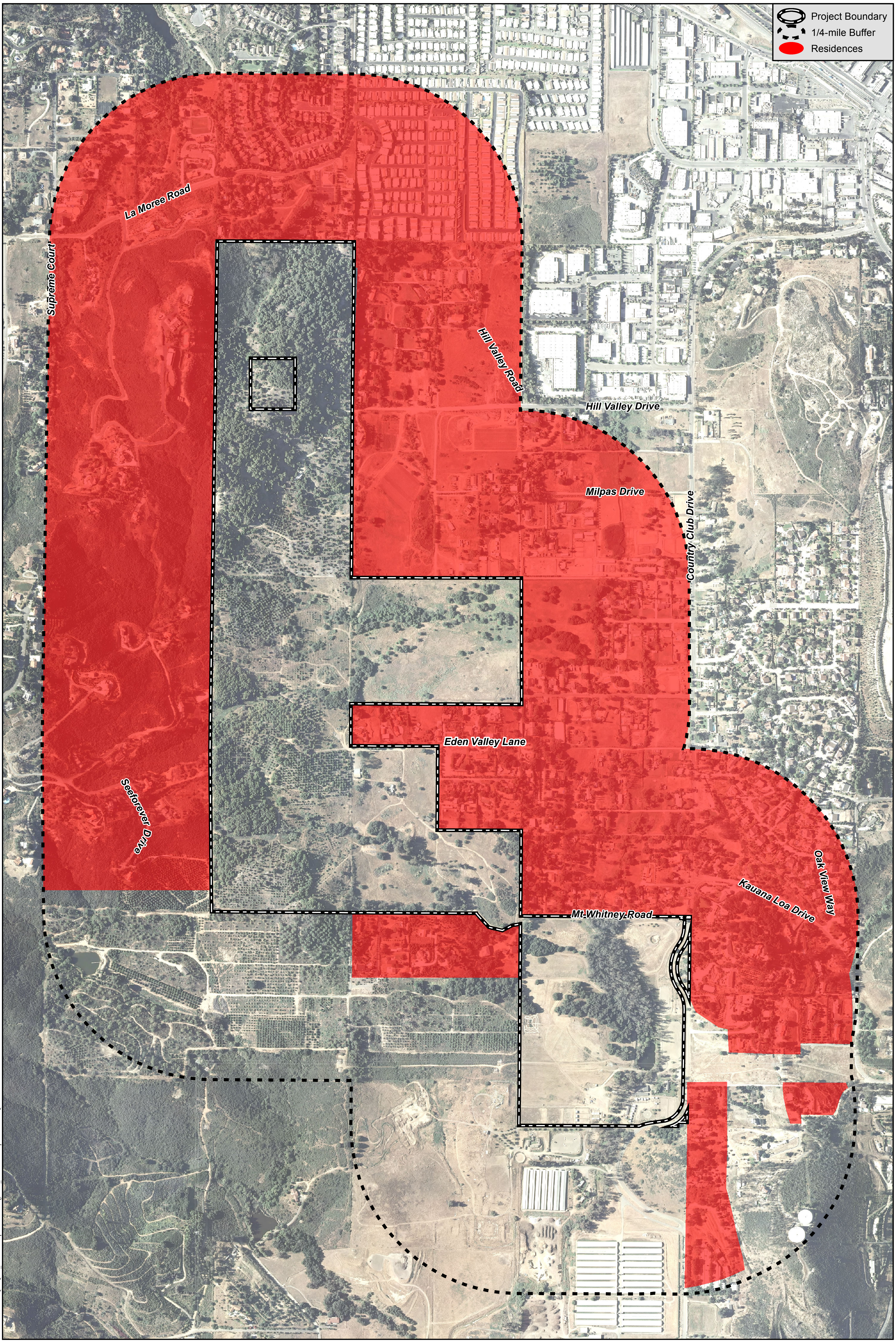

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Location of Sensitive Receptors

VALIANO

HELIX
Environmental Planning

0 700 Feet

Figure 2.2-1