3.1 Air Quality

3.1.1 Overview

This section describes the existing air quality conditions and applicable laws and regulations associated with air quality, as well as an analysis of the potential effects resulting from implementation of the proposed project. Information contained in this section is summarized from the *Air Quality and Greenhouse Gas Technical Memorandum* (Appendix B).

3.1.2 Environmental Setting

Climate

The project is located in the City of Long Beach, an area within the South Coast Air Basin (SCAB), which includes Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in SCAB is administered by the SCAQMD.

SCAB climate is determined by its terrain and geographical location. SCAB is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the SCAB. The region lies in the semi-permanent high pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted; however, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the SCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). The annual average maximum temperature recorded at the Long Beach Daugherty Field Station, the closest climatological station to the project site, is 74.2°F, and the annual average minimum is 54.8°F. January is typically the coldest month in this area of the SCAB. The majority of annual rainfall in the SCAB occurs between November and April. Average rainfall measured at the Long Beach Daugherty Field Station varies from 2.90 inches in February to 0.19 inch or less between June and September, with an average annual total of 12.01 inches.

The SCAB experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed from midafternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Inversion layers are essential in determining ozone (O_3) formation. O_3 and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as carbon monoxide (CO). Particles of 10 micrometers and smaller (PM_{10}) are both directly emitted and created indirectly in the atmosphere as a result of chemical reactions. Concentration levels are directly related to inversion layers because of the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, when heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore and east into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are from CO and oxides of nitrogen (NO_X) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_X to form photochemical smog.

Monitored Air Quality Pollutants

SCAQMD monitors air quality conditions at 37 locations throughout SCAB. The closest monitoring stations to the project site are the Long Beach – Hudson Station, located at 2425 Webster Street and the South Long Beach Station located at 1305 Pacific Coast Highway. Table 3.1-1 shows pollutant levels, the state and federal standards, and the number of exceedances recorded at these stations from 2015 to 2017.

Table 3.1-1. Ambient Air Quality Monitoring Concentrations

Pollutant	Pollutant Concentration and Standard	Maximum Concentration		
		2015	2016	2017
CO	Maximum 1-hour concentration (ppm)	3.3	3.3	3.9
	Days> 20 ppm (state 1-hour standard)	0	0	0
	Days> 35 ppm (federal 1-hour standard)	0	0	0
	Maximum 8-hour concentration (ppm)	2.2	2.2	2.6
	Days> 9 ppm (state 8-hour standard)	0	0	0
	Days> 9 ppm (federal 8-hour standard)	0	0	0
O_3	Maximum 1-hour concentration (ppm)	0.087	0.079	0.082
	Days> 0.09 ppm (state 1-hour standard)	0	0	0
	Maximum 8-hour concentration (ppm)	0.066	0.059	0.068
	Days> 0.070 ppm (state 8-hour standard)	0	0	0
	Days> 0.070 ppm (federal 8-hour standard)	0	0	0

Table 3.1-1. Ambient Air Quality Monitoring Concentrations

Pollutant	Pollutant Concentration and Standard	Maximum Concentration		
		2015	2016	2017
NO_2	Maximum 1-hour concentration (ppm)	0.102	0.076	0.090
	Days> 0.18 ppm (state 1-hour standard)	0	0	0
	Days> 0.10 ppm (federal 1-hour standard)	1	0	0
	Annual arithmetic mean (ppm)	0.020	0.019	0.018
	Exceed 0.030 ppm? (state annual standard)	No	No	No
	Exceed 0.053 ppm? (federal annual standard)	No	No	No
PM_{10}	Maximum 24-hour concentration (µg/m^3)	62	57	71
	Days> 50 µg/m^3 (state 24-hour standard)	2	4	2
	Days> 150 µg/m^3 (federal 24-hour standard)	0	0	0
	Annual arithmetic mean (µg/m^3)	26.5	27.8	14.7
	Exceed 20 µg/m^3? (state annual standard)	Yes	Yes	No
$PM_{2.5}$	Maximum 24-hour concentration (µg/m^3)	48.3	28.9	56.3
	Days> 35 µg/m^3 (federal 24-hour standard)	4	0	5
	Annual arithmetic mean (µg/m^3)	10.2	9.5	11.0
	Exceed 12 µg/m^3? (state annual standard)	No	No	No
	Exceed 12 µg/m^3? (federal Annual Standard)	No	No	No

Notes:
µg/m^3=microgram per cubic meter; CO=carbon monoxide; NO_2=nitrogen dioxide; O_3=ozone; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller; ppm=parts per million

Carbon Monoxide

CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircrafts, and trains. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. As identified in Table 3.1-1, the CO concentrations in the project area have not exceeded the federal or state standards in the past 3 years.

Ozone

O_3 is a colorless gas that is formed in the atmosphere when reactive organic gases (ROG), which includes volatile organic compounds (VOC), and NO_X react in the presence of ultraviolet sunlight. O_3 is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of ROG and NO_X, the components of O_3, are automobile exhaust and industrial sources. The greatest source of smog-producing gases is the automobile. Short-term exposure (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. As identified in Table 3.1-1, the 8-hour O_3 standards were not exceeded in the past 3 years.

Oxides of Sulfur

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

Coarse Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Inhalable particulate matter, or PM_{10}, is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. When inhaled, PM_{10} particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. As identified in Table 3.1-1, the state and federal PM_{10} standards were exceeded in 2015 and 2016.

Fine Particulate Matter

Fine particulate matter, or particles of 2.5 micrometers and smaller ($PM_{2.5}$), is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases, such as SO_2, NO_X, and VOC. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body. These substances can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility. As identified in Table 3.1-1, the federal $PM_{2.5}$ standards were exceeded in 2015 and 2017.

Volatile Organic Compounds or Reactive Organic Gases

VOCs are carbon-containing compounds that evaporate into the air. VOCs contribute to the formation of smog and may be toxic. VOCs often have an odor, and examples include, gasoline, alcohol, and the solvents used in paints. The SCAQMD does not directly monitor VOCs. There are no specific state or federal VOC thresholds, as they are regulated by individual air districts as O_3 precursors.

Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics, particulate matter, and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The majority of the land uses in the project area are commercial and industrial in nature. The Calvary Chapel – Signal Hill church is located approximately 150 feet east of the project site across Orange Avenue and is the closest sensitive receptor to the project site. The closest residences to the project site are the homes located 1,200 feet to the north across I-405. Due to the distance of the nearest sensitive receptors to the project site, a Health Risk Assessment was not conducted.

3.1.3 Regulatory Framework

Table 3.1-2 identifies and summarizes laws, regulations, and plans relative to air quality. Table 3.1-3 lists the federal and state air pollutant standards, the principal health and atmospheric effects, the typical sources, and the current attainment status of the criteria pollutant emissions.

Table 3.1-2. Applicable Laws, Regulations, and Plans for Air Quality

Laws, Regulation, or Plan	Description
Federal	
FCAA	The FCAA, enacted in 1963, established federal air quality standards known as NAAQS. NAAQS standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: CO, NO_2, O_3, particulate matter, which is broken down for regulatory purposes into PM_{10} and $PM_{2.5}$, and SO_2. In addition, national standards exist for Pb. The NAAQS standards are set at levels that protect public health, with a margin of safety, and are subject to periodic review and revision. Toxic air contaminants are covered as well. The FCAA requires the U.S. EPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The U.S. EPA has classified the SCAB as attainment/maintenance for CO, PM_{10}, and NO_2 and nonattainment for O_3 and $PM_{2.5}$. In addition, the Los Angeles County portion of the SCAB is in nonattainment for Pb.

Table 3.1-2. Applicable Laws, Regulations, and Plans for Air Quality

Laws, Regulation, or Plan	Description
State	
CCAA	The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts explicit authority to implement transportation control measures and regulate indirect sources of air pollution. The CCAA focuses on attainment of the California Ambient Air Quality Standards, which for certain pollutants and averaging periods are more stringent than the comparable federal standards. The following are criteria pollutants which both the CARB and U.S. EPA regulate; CO, NO_2, SO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb. California Ambient Air Quality Standards are generally more stringent than the NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, and vinyl chloride, and visibility-reducing particles.
California SIP	The 1990 amendments to the FCAA set new deadlines for attainment based on the severity of the pollution problem and launched a comprehensive planning process for attaining the NAAQS. The promulgation of the national 8-hour O_3 standard and the $PM_{2.5}$ standards in 1997 resulted in additional statewide air quality planning efforts. SIPs are not single documents, but rather a compilation of new and previously submitted plans, programs, district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. State law makes CARB the lead agency for all SIP-related purposes. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the U.S. EPA for approval and publication in the *Federal Register*. The Code of Federal Regulations Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items included in the California SIP.
Local	
SCAQMD	SCAQMD is the agency principally responsible for comprehensive air pollution control in the region. Specifically, SCAQMD is responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. Programs that were developed include air quality rules and regulations that regulate stationary sources, area sources, point sources, and certain mobile source emissions. SCAQMD is also responsible for establishing stationary source permitting requirements and ensuring that new, modified, or relocated stationary sources do not create net emission increases.

Table 3.1-2. Applicable Laws, Regulations, and Plans for Air Quality

Laws, Regulation, or Plan	Description
SCAQMD AQMP	The FCAA requires areas not attaining the NAAQS to develop and implement an emission reduction strategy that would bring the area into attainment in a timely manner. The SCAQMD 2016 AQMP is the SCAQMD plan for improving regional air quality. It addresses FCAA requirements and demonstrates attainment with state and federal ambient air quality standards. The AQMP is prepared by SCAQMD in collaboration with the Southern California Association of Governments and the CARB. The AQMP provides policies and control measures that reduce emissions to attain both state and federal ambient air quality standards by their applicable deadlines. Environmental review of individual projects within the SCAB must demonstrate that daily construction and operational emissions thresholds, as established by the SCAQMD, would not be exceeded. The environmental review must also demonstrate that individual projects would not increase the number or severity of existing air quality violations. The 2016 AQMP was adopted by the SCAQMD Governing Board on March 3, 2017. It incorporates the latest scientific and technological information and planning assumptions, including the Southern California Association of Governments' 2016 Regional Transportation Plan/Sustainable Communities Strategy and updated emission inventory methodologies for various source categories.

Notes:

AQMP=Air Quality Management Plan; CARB=California Air Resources Board; CCAA=California Clean Air Act; CO=carbon monoxide; FCAA=Federal Clean Air Act; NAAQS=U.S. National Ambient Air Quality Standards; NO_2=nitrogen dioxide; O_3=ozone; Pb=lead; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller; SCAB=South Coast Air Basin; SCAQMD=South Coast Air Quality Management District; SIP=State Implementation Plan; SO_2=sulfur dioxide; U.S. EPA=United States Environmental Protection Agency

Table 3.1-3. Federal and State Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard8	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status
O_3[2]	1 hour 8 hours	0.09 ppm 0.070 ppm	— 0.070 ppm[4] (4th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude O_3 is almost entirely formed from ROG or VOC and NO_X in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	Federal: Extreme Nonattainment (8-hour) State: Nonattainment (1-hour and 8-hour)
CO	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm[1] 6 ppm	35 ppm 9 ppm —	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical O_3.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Federal: Attainment/ Maintenance State: Attainment
Respirable Particulate Matter (PM_{10})[2]	24 hours Annual	50 µg/m[3] 20 µg/m[3]	150 µg/m3 --- 2 (expected number of days above standard < or equal to 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	Federal: Attainment/ Maintenance State: Nonattainment

Table 3.1-3. Federal and State Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard8	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status
Fine Particulate Matter ($PM_{2.5}$)[2]	24 hours	—	35 µg/m3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NO_X, SOx, ammonia, and ROG.	Federal: Nonattainment State: Nonattainment
	Annual	12 µg/m3	12.0 µg/m3			
	Secondary	—	15 µg/m3			
	Standard (annual)		(98th percentile over3 years)			
NO_2	1 hour	0.18 ppm	100 ppb[6] (98th percentile over 3 years)	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the NO_X group of O_3 precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	Federal: Attainment/ Maintenance State: Attainment
	Annual	0.030 ppm	0.053 ppm			
SO_2	1 hour	0.25 ppm	75 ppb[7] (99th percentile over 3 years)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Federal: Attainment/ Unclassified State: Attainment/ Unclassified
	3 hours	—	0.5 ppm[9]			
	24 hours	0.04 ppm	0.14 ppm			
	Annual Arithmetic Mean	---	0.03 ppm			

Table 3.1-3. Federal and State Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard8	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status
Pb[3]	Monthly Calendar Quarter Rolling 3-month average	1.5 µg/m^3 — —	— 1.5 µg/m^3 0.15 µg/m$^{3(10)}$	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Pb-based industrial processes like battery production and smelters. Pb paint, leaded gasoline. Aerially deposited Pb from gasoline may exist in soils along major roads.	Federal: Attainment (Los Angeles County region in nonattainment) State: Attainment
Sulfate	24 hours	25 µg/m^3	—	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries, and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	Federal: — State: Attainment/ Unclassified
H_2S	1 hour	0.03 ppm	—	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	Federal: — State: Attainment/ Unclassified

Table 3.1-3. Federal and State Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard8	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status
Visibility reducing particles	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70 percent	—	Reduces visibility. Produces haze. NOTE: not related to the Regional Haze program under the FCAA, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.	See particulate matter above.	Federal: — State: Attainment/ Unclassified
Vinyl Chloride[3]	24 hours	0.01 ppm	—	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	Federal: — State: Attainment/ Unclassified

Source: CARB 2011, 2019

Notes:

[1] Rounding to an integer value is not allowed for the State 8-hour CO standard. Violation occurs at, or above, 9.05 ppm.

[2] Annual PM_{10} NAAQS revoked October 2006; was 50 µg/m^3. 24-hour. $PM_{2.5}$ NAAQS tightened October 2006; was 65 µg/m^3. Annual $PM_{2.5}$ NAAQS tightened from 15 µg/m^3 to 12 µg/m^3 December 2012, and secondary standard set at 15 µg/m^3.

[3] The CARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the CARB and the U.S. EPA have identified Pb and various organic compounds that are precursors to O_3 and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for substantial health effects due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

[4] Prior to June 2005, the 1-hour NAAQS was 0.12 ppm. Emission budgets for 1-hour O_3 are still in use in some areas where 8-hour O_3 emission budgets have not been developed, such as the San Francisco Bay Area. On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[5] The 0.08 ppm 1997 O_3 standard is revoked FOR CONFORMITY PURPOSES ONLY when area designations for the 2008 0.75 ppm standard become effective for conformity use (July 20, 2013). Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for newer NAAQS are found adequate, SIP amendments for the newer NAAQS are approved with an emission budget, U.S. EPA specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. SIP-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved SIP amendment. During the "Interim" period prior to availability of emission budgets, conformity tests may include some combination of build vs. no build, build vs. baseline, or compliance with prior emission budgets for the same pollutant.

Table 3.1-3. Federal and State Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard8	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status

[6] Final 1-hour NO_2 NAAQS published in the Federal Register on February 9, 2010, effective March 9, 2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause redesignation to nonattainment in some areas after 2016.

[7] The U.S. EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010. Nonattainment areas have not yet been designated as of September 2012.

[8] California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the CCR.

[9] National standards (other than O_3, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 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 3 years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

[10] Lead NAAQS are not considered in Transportation Conformity analysis

µg/m^3=microgram per cubic meter; CARB=California Air Resources Board; CCR=California Code of Regulations; CO=carbon monoxide; FCAA=Federal Clean Air Act; H_2S=hydrogen sulfide; NAAQS=U.S. National Ambient Air Quality Standards; NO_2=nitrogen dioxide; NO_X=oxides of nitrogen; O_3=Ozone; Pb=lead; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller; ppm=parts per million; ROG=reactive organic gases; SCAB=South Coast Air Basin; SIP=State Implementation Plan; SO_2=sulfur dioxide; SO_X=sulfur oxides; U.S. EPA=United States Environmental Protection Agency; VOC=volatile organic compounds

3.1.4 Analysis of Impacts

Methodology

Emissions of criteria air pollutants were estimated using existing conditions information, project construction details, and project operations information, as well as a combination of emission factors from the following sources:

- California Emissions Estimator Model (CalEEMod) (Version 2016.3.2) emission model for estimating exhaust emissions from off-road construction equipment and on-road motor vehicles
- CalEEMod (Version 2016.3.2) emission model for calculating the long-term mobile, energy, and area source emissions

Thresholds of Significance

Based on CEQA Guidelines Appendix G, project impacts related to air quality are considered significant if any of the following occur:

a) Conflict with or obstruct implementation of the applicable air quality plan

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard

c) Expose sensitive receptors to substantial pollutant concentrations

d) Result in other emissions such as those leading to odors adversely affecting a substantial number of people

As discussed in the IS (Appendix A), criterion (d) would result in no impact, and therefore, is not included in the analysis below.

South Coast Air Quality Management District Guidelines

The *CEQA Air Quality Handboo*k (SCAQMD 1993) was used to determine whether potential air quality impacts of the project are significant. Table 3.1-4 lists the daily thresholds for construction and operational emissions that have been established by SCAQMD.

Table 3.1-4. South Coast Air Quality Management District Air Quality Thresholds of Significance

Pollutant	Construction (pounds/day)	Operation (pounds/day)
NO_X	100	55
VOCs	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_x	150	150
CO	550	550

Source: SCAQMD 1993

Notes:

CO=carbon monoxide; NO_X=oxides of nitrogen; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller; SO_x=oxides of sulfur; VOC=volatile organic compounds

SCAQMD has developed localized significance threshold (LST) methodology and tables that show mass rate look-up by source receptor area that can be used by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts (SCAQMD 2008). LSTs represent the maximum emissions from a project that would not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard and are developed based on the ambient concentrations of that pollutant for each source receptor area. LSTs are derived based on the location of the activity (i.e., the source receptor area); the emission rates of NOx, CO, PM_{10}, and $PM_{2.5}$; the size of the project study area; and the distance to the nearest exposed individual.

For this project, the appropriate source receptor area for the LST is the South Coastal Los Angeles County area (Area 4). As described above, the only sensitive receptor within 0.25 mile of the project site is the church located to the east at a distance of approximately 150 feet and the landscape is dominated by commercial and industrial land uses. Although the proposed project site is 7.8 acres, the three buildings do not cover the entire 7.8 acres, which means less than 5 acres would be under development at any one time. Therefore, the 5-acre LST rates are used for this project. Table 3.1-5 lists the LST emission rates for a 5-acre site located within 50 meters (per SCAQMD 2008; 164 feet) of a sensitive use.

Table 3.1-5. South Coast Air Quality Management District Localized Significance Thresholds

Pollutant	Construction (pounds/day)	Operation (pounds/day)
NOx	165	165
CO	1,982	1,982
PM_{10}	42	10
$PM_{2.5}$	10	3

Source: SCAQMD 1993

Notes:

CO=carbon monoxide; NO_X=oxides of nitrogen; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller

Impact Analysis

Threshold (a) Conflict with or obstruct implementation of the applicable air quality plan.

Construction

Construction activities associated with implementation of the project have the potential to create air quality impacts through the use of heavy-duty construction equipment, construction worker vehicle trips, material delivery trips, and heavy-duty haul truck trips generated from construction activities. In addition, earthwork activities would result in fugitive dust emissions and paving operations and would also release ROGs from off-gassing. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. The assessment of construction air quality impacts considers each of these potential sources and provides a conservative estimate of construction air quality impacts. Table 3.1-6 shows the anticipated emissions related to construction phases.

Table 3.1-6. Construction Emissions

Phase	CO	ROGs	NOx	PM_{10}	$PM_{2.5}$
Site preparation	22.9	4.4	45.7	10.7	6.8
Grading	14.6	2.7	31.6	4.3	2.7
Building construction	27.2	3.7	33.2	3.5	2.0
Paving	15.3	1.5	14.1	1.0	0.7
Architectural coating	4.9	18.7	3.5	0.5	0.3
Peak day (pound/day)	**30.8**	**22.1**	**45.6**	**10.7**	**6.7**
SCAQMD thresholds	**550**	**75**	**100**	**150**	**55**
Exceedance	**No**	**No**	**No**	**No**	**No**

Notes:
CO=carbon monoxide; NO_X=oxides of nitrogen; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller; ROG=volatile organic gases; SCAQMD=South Coast Air Quality Management District

Table 3.1-7 shows the construction-related emissions of CO, NOx, PM_{10}, and $PM_{2.5}$ compared with the LSTs for the South Coastal Los Angeles County area at a distance of 50 meters (per SCAQMD 2008; 164 feet) using a 5-acre LST metric. As required by the SCAQMD's *LST Methodology* (2008), only the on-site construction emissions are included in Table 3.1-7.

Table 3.1-7. Summary of On-Site Construction Emissions, Localized Significance

	Emission Rates (pounds/day)			
Project Phase	CO	NO_X	PM_{10}	$PM_{2.5}$
Site preparation	22.1	45.6	10.5	6.7
Grading	14.2	31.6	4.2	2.7
Building construction	19.2	26.3	1.5	1.4
Paving	14.7	14.1	0.8	0.7
Architectural coating	3.7	3.4	0.2	0.2
Peak day (pound/day)	**22.9**	**45.6**	**10.5**	**6.7**
SCAQMD thresholds	**1,982**	**165**	**42**	**10**
Exceeds daily SCAQMD threshold?	**No**	**No**	**No**	**No**

Notes:
CO=carbon monoxide; NO_X=oxides of nitrogen; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller; SCAQMD=South Coast Air Quality Management District

The calculated emissions rates for the proposed on-site construction activities would not exceed the SCAQMD's LSTs.

Operation

Long-term air pollutant emission impacts are those associated with stationary sources and mobile sources involving any project-related changes. The proposed project would have potential long-term operational air quality impacts from mobile source emissions associated with project-related vehicular trips and stationary source emissions from on-site energy consumption. Table 3.1-8 shows anticipated daily operational emissions.

Table 3.1-8. Daily Operational Emissions

Source	CO	NOx	ROG	SO_x	PM_{10}	$PM_{2.5}$
Area	0.02	0.0	3.7	0.0	0.0	0.0
Energy	0.7	0.8	0.1	0.0	0.1	0.1
Mobile	18.2	14.7	1.2	0.1	6.1	1.7
Total	18.9	15.5	5.0	0.1	6.2	1.8
SCAQMD thresholds	**550**	**55**	**55**	**150**	**150**	**55**
Exceeds daily SCAQMD threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
Columns may not add up due to rounding.
CO=carbon monoxide; NO_X=oxides of nitrogen; PM_{10}=particles of 10 micrometers and smaller; $PM_{2.5}$=particles of 2.5 micrometers and smaller; ROG=Volatile Organic Gases; SCAQMD=South Coast Air Quality Management District; SO_X=oxides of sulfur

Table 3.1-9 identifies the operational emissions of CO, NO_X, PM_{10}, and $PM_{2.5}$ compared with the LSTs for the South Coastal Los Angeles area at a distance of 50 meters (per SCAQMD 2008; 164 feet). As required by the SCAQMD's LST Methodology, only the on-site emissions are included in Table 3.1-9, which includes all of the area source and energy emissions, and 5 percent of the on-road emissions. As shown, the calculated emissions rates for the proposed on-site operational activities would not exceed the LSTs.

Table 3.1-9. Summary of On-Site Operation Emissions, Localized Significance

Project Phase	Emission Rates (pounds/day)			
	CO	NO_x	PM_{10}	$PM_{2.5}$
Area	0.02	0.0	0.0	0.0
Energy	0.7	0.8	0.1	0.1
Mobile	0.9	0.7	0.3	0.1
Total (pounds/day)	**1.6**	**1.5**	**0.4**	**0.2**
SCAQMD thresholds	**1,982**	**165**	**10**	**3**
Exceeds daily SCAQMD threshold?	**No**	**No**	**No**	**No**

Notes:
CO=carbon monoxide; NO_X=oxides of nitrogen; $PM_{2.5}$=particles of 2.5 micrometers and smaller; PM_{10}=particles of 10 micrometers and smaller; SCAQMD=South Coast Air Quality Management District

Given the extremely low level of CO concentrations in the project area, project-related vehicular trips are not anticipated to result in the CO concentrations exceeding the state or federal CO standards. Because no CO hot spot would occur, there would be no project-related impacts on CO concentrations.

Conclusion

An Air Quality Management Plan (AQMP) describes air pollution control strategies to be taken by a city/county or region classified as a nonattainment area. The main purpose of an AQMP is to bring the area into compliance with the requirements of federal and state air quality standards. CEQA requires that certain proposed projects be analyzed for consistency with AQMP. For a project to be consistent with the 2016 AQMP, the pollutants emitted from the project should not exceed the SCAQMD daily threshold or cause a significant impact on air quality (SCAQMD 2016). However, if feasible mitigation measures are implemented and shown to reduce the impact level from significant to less than significant, the project is deemed consistent with AQMP. The project's short-term construction and long-term operational emissions would not exceed the SCAQMD's significance thresholds and implementation of the project will not conflict with the 2016 AQMP. Impacts would be less than significant.

Threshold (b) ***Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.***

Air pollutant emissions would occur over the short term from construction activities and would be generated by fugitive dust from site preparation and grading and emissions from equipment exhaust.

As described under threshold (a) above and shown in Table 3.1-6 and Table 3.1-7, the short-term air emissions associated with construction activities would be below the SCAQMD's threshold of significance; however, fugitive dust emissions generated during construction may cause significant impacts if not properly managed, especially on sensitive receptors near the project site. This potential

impact would be considered significant. Long-term regional emissions are associated with project-related vehicular trips and stationary source emissions; however, as described in threshold (a) above and shown in Table 3.1-8 and Table 3.1-9, these emissions would not exceed the SCAQMD daily thresholds. Implementation of **Mitigation Measure AQ-1** would reduce potential short-term construction related significant impacts to a level less than significant.

Additionally, while the calculated short-term air quality emissions are below the SCAQMD's thresholds of significance, the following measures shall be implemented as best management practices (BMP):

- Ensure that all construction equipment is properly tuned and maintained
- Minimize idling time to 5 minutes, which saves fuel and reduces emissions
- Minimize unnecessary vehicular and machinery activities

Threshold (c) Expose sensitive receptors to substantial pollutant concentrations.

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics, particulate matter, and CO are of particular concern. The closest sensitive receptors to the project are homes located 1,200 feet to the north across I-405. The Calvary Chapel – Signal Hill Church is located approximately 150 feet east of the project site across Orange Avenue and is surrounded by commercial and industrial land uses. As discussed under threshold (a) above, project emissions related to temporary construction and project operations would not exceed SCAQMD thresholds; therefore, sensitive receptors would not experience significant pollutant concentrations as a result of the project. This is considered a less than significant impact.

Cumulative Impacts

The proposed project area is currently in nonattainment for O_3, PM_{10}, and $PM_{2.5}$. As shown in Table 3.1-6 and Table 3.1-7, the proposed project's construction emissions would not exceed the SCAQMD's significance thresholds. Appendix D to SCAQMD's white paper on cumulative impacts states projects that do not exceed the project-specific thresholds are likewise generally not considered to be cumulatively significant (SCAQMD 2003). Based on SCAQMD's regulatory jurisdiction over regional air quality, it is reasonable to rely on its guidance to determine whether there is a cumulative air quality impact. Therefore, construction of the proposed project would not contribute to significant cumulative air quality impacts.

As shown in Table 3.1-8 and Table 3.1-9, the proposed project's operational emissions would not exceed the SCAQMD's long-term emission thresholds and, as a result, there would be no cumulative operational air quality impacts. Therefore, the project would not contribute to a long-term cumulative air quality impact.

Mitigation Measures

AQ-1 **Fugitive Dust Control.** During clearing, grading, earthmoving, or excavation operations, excessive fugitive dust emissions shall be controlled by regular watering or other dust preventive measures using the following procedures, as specified in SCAQMD Rule 403. All material excavated or graded shall be sufficiently watered in sufficient quantities to prevent the generation of visible dust plumes. Watering will occur at least twice daily with complete coverage, preferably in the late morning and after work is done for the day. All material transported on-site or off-site shall be securely covered to prevent excessive amounts of dust. The area disturbed by clearing, grading, earth moving, or excavation operations shall be minimized so as to prevent excessive amounts of dust. These control techniques shall be indicated in project specifications.

In addition, where feasible, the following measures will be implemented to reduce fugitive dust emissions:

- Minimize land disturbance
- Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas
- Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes
- Cover trucks when hauling dirt
- Stabilize the surface of dirt piles if not removed immediately
- Limit vehicular paths on unpaved surfaces and stabilize any temporary roads
- Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway
- Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities
- Provide an operational water truck on-site at all times and use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas

Level of Significance after Mitigation

Implementation of **Mitigation Measure AQ-1** would reduce short-term construction related potential significant impacts to a level less than significant by requiring fugitive dust control measures.