5.2 AIR QUALITY

This section evaluates air quality associated with short- and long-term impacts resulting from buildout of the Old Town Yucca Valley Specific Plan. Information in this section is based primarily on the *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines (May 2006),* prepared by the Mojave Desert Air Quality Management District (MDAQMD), Air Quality Data (California Air Resources Board 2001 through 2005, and the *MDAQMD 2004 Ozone Attainment Plan (State and Federal)* (*Attainment Plan*).

5.2.1 EXISTING SETTING

MOJAVE DESERT AIR BASIN

The State of California is divided geographically into 15 air basins. The Town of Yucca Valley is located within the Mojave Desert Air Basin (MDAB). The MDAB includes the desert portions of Los Angeles and San Bernardino Counties, the eastern desert portion of Kern County, and the northeastern desert portion of Riverside County. This MDAQMD has jurisdiction over the desert portion of San Bernardino County and the far eastern end of Riverside County. This region includes the incorporated communities of Adelanto, Apple Valley, Barstow, Blythe, Hesperia, Needles, Twentynine Pines, Victorville, and Yucca Valley. This region also includes the National Training Center (NTC) at Fort Irwin, the Marine Corps Air Ground Combat Center, and the Marine Corps Logistics Base in the eastern portion of Edwards Air Force Base.

CLIMATE

During the summer a Pacific Subtropical High cell that sits off the coast generally influences the MDAB, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with at least 0.01 inches of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, to indicate at least three months have maximum average temperatures over 100.4° F.

WIND

Local meteorological conditions are greatly affected by the topography of the region. Wind direction is primarily from the west, west-southwest and southwest. A significant portion of the prevailing winds in the Yucca Valley area is due to the phenomena known as the “orographic effect.” The air is forced over the mountain range and loses moisture as it rises. When it descends, it also compresses and heats up. The speed of the wind is aided by the “desert heat lows,” which routinely form over the eastern Mojave Desert area. Although a portion of Yucca Valley’s

winds comes from the Los Angeles Basin via the canyons, the vast majority of the winds are a result of the orographic effect and the desert heat low-pressure systems. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in Southern California by differential heating are channeled through the MDAB. The MDAB is separated from the southern California coastal and central California Valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses.

TEMPERATURE INVERSIONS

The southern California region frequently experiences temperature inversions in which pollutants are trapped and accumulate close to the ground. The inversion, a layer of warm, dry air overlaying cool, moist marine air, is a normal condition in the southland. The cool, damp and hazy sea air capped by coastal clouds is heavier than the warm, clear air that acts as a lid through which the marine layer cannot rise. When the inversion layer is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over mountain slopes or through passes. At a height of 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer. Smog in southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long period of time, allowing them to form secondary pollutants by reacting with sunlight.

The inversion conditions in the MDAB are much less favorable for the buildup of high ozone concentrations than in the coastal areas of Southern California. When subsidence inversions occur, they are generally 6,000 to 8,000 feet above the desert surface, allowing much greater vertical mixing than along the coast where the inversion base is often much lower. As a result, meteorology in the MDAB is less conducive for the chemical mixing characteristic of typical ozone formation.

MONITORED AIR QUALITY LEVELS

The Project area's local ambient air quality is monitored by the Mohave Desert Air Quality Management District (MDAQMD) and the California Air Resources Board (CARB). CARB monitors ambient air quality at approximately 250 air monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations ten feet above-ground level; therefore, air quality is often referred to in terms of ground-level concentrations.

The Joshua Tree-National Monument monitoring station in the MDAB is the nearest monitoring station to Yucca Valley, located approximately 12 miles to the south, but only monitors 8-hour ozone (O_3). Other monitoring stations including Palm Springs-Fire Station (20 miles south), Lucerne Valley-Middle School (35 miles northwest), and Victorville-Park Avenue (55 miles northwest), were used to collect data on sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), fine particulate matter ($PM_{2.5}$), and coarse particulate matter (PM_{10}). Air quality data from 2001 to 2005 from the monitoring stations is provided in Table 5.2-1, *Local Air Quality Levels*. The following air quality information briefly describes the various types of pollutants.

Table 5.2-1
Local Air Quality Levels

Pollutant	California Standard	Federal Primary Standard	Year	Maximum Concentration[1]	Days (Samples) State/Federal Standard was Exceeded
Ozone (O_3) 1 hour	0.09 ppm	NA	2001	0.137[2]	53/6
			2002	0.136[2]	49/2
			2003	0.141[2]	54/4
			2004	0.125[2]	36/1
			2005	0.139[2]	41/4
Ozone (O_3) 8 hour	0.070 ppm	0.08 ppm	2001	0.106[3]	3/0
			2002	0.133[3]	38/3
			2003	0.140[3]	41/9
			2004	0.137[3]	35/3
			2005	0.131[3]	38/2
Carbon Monoxide (CO)	9.0 ppm (8 hour)	9.0 ppm (8 hour)	2001	1.60[2]	0/0
			2002	1.14[2]	0/0
			2003	1.39[2]	0/0
			2004	0.80[2]	0/0
			2005	0.80[2]	0/0
Nitrogen Dioxide (NO_2)	0.25 ppm (1 hour)	0.053 ppm annual average	2001	0.081[2]	0/NA
			2002	0.068[2]	0/NA
			2003	0.067[2]	0/NA
			2004	0.066[2]	0/NA
			2005	0.059[2]	0/NA
Particulate Matter (PM_{10})[6,7]	50 ug/m^3 (24 hours)	150 ug/m^3 (24 hours)	2001	50.0[4]	NA/0
			2002	46.0[4]	NA/0
			2003	79.0[4]	1/0
			2004	53.0[4]	0/0
			2005	64.0[4]	1/0
Fine Particulate Matter ($PM_{2.5}$)[7]	12 μg/m^3 Annual Arithmetic mean	65μg/m^3 (24 hours)	2001	44.7[2]	NA/0
			2002	42.3[2]	NA/0
			2003	21.2[2]	NA/0
			2004	27.1[2]	NA/0
			2005	26.1[2]	NA/0
Sulfur Dioxide (SO_2)	0.25 ppm (1 hour)	0.14 ppm for 24 hours or 0.03 ppm annual arithmetic mean	2001	0.005[5]	0/0
			2002	0.006[5]	0/0
			2003	0.006[5]	0/0
			2004	0.003[5]	0/0
			2005	0.003[5]	0/0

Source: Aerometric Data Analysis and Measurement System (ADAM), summaries from 2001 to 2005, http://www.arb.ca.gov/adam.

ppm = parts per million; PM_{10} = particulate matter 10 microns in diameter or less; NM = not measured; μg/m^3 = micrograms per cubic meter; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; NA = not applicable.

1. Maximum concentrations are measured over the same period as the California standard.
2. Palm Springs-Fire Station monitoring station is located at 590 East Racquet Club Avenue, Palm Springs, CA 92262.
3. Joshua Tree-National Monument monitoring station is the closest 8-hour Ozone monitoring to the Project site located at Black Rock, Joshua Tree National Park, CA 92252.
4. Lucerne Valley-Middle School monitoring station is the closest PM_{10} monitoring station to the Project site located 8532 Aliento Road, Lucerne, CA 92356.
5. Victorville-Park Avenue monitoring station is the closest SO_x monitoring station located at 14306 Park Avenue, Victorville, CA 92392.
6. PM_{10} exceedances are based on State thresholds established prior to amendments adopted on June 20,2002.
7. PM_{10} and $PM_{2.5}$ exceedances are derived from the number of samples exceeded, not days.

Ozone

Ozone occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. The troposphere extends approximately 10 miles above ground level, where it meets the second layer, the stratosphere. The stratospheric (the "good" ozone layer) extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B).

"Bad" ozone is a photochemical pollutant, and needs volatile organic compounds (VOC), nitrogen oxides (NO_X), and sunlight to form; therefore, VOCs and NO_X are ozone precursors. VOCs and NO_X are emitted from various sources throughout the Town. To reduce ozone concentrations, it is necessary to control the emissions of these ozone precursors. Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins.

While ozone in the upper atmosphere (stratosphere) protects the earth from harmful ultraviolet radiation, high concentrations of ground-level ozone (in the troposphere) can adversely affect the human respiratory system and other tissues. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems (such as forests and foothill plant communities) and damages agricultural crops and some man-made materials (such as rubber, paint and plastics). Societal costs from ozone damage include increased healthcare costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

The State ozone standard is 0.09 parts per million (ppm), averaged over one hour. The State standard at the Victorville-Park Avenue monitoring station was exceeded 91 days between 2001 and 2005. The Federal standard for O_3 is 0.12 ppm, averaged over one hour, and was exceeded 7 days between 2001 and 2005. The MDAB is designated as a nonattainment area for State and Federal O_3 standards.

Carbon Monoxide

Carbon monoxide is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, unconsciousness and death. State and Federal standards were not exceeded in between 2001 and 2005. The MDAB is designated as an attainment area for State and Federal CO standards.

Nitrogen Dioxide

Nitrogen oxides are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone, and react in the atmosphere to form acid rain. Nitrogen dioxide (NO_2), often used interchangeably with NO_X, is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in

areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations).

NO_X can irritate and damage the lungs, and lower resistance to respiratory infections such as influenza. The health effects of short-term exposure are still unclear. However, continued or frequent exposure to NO_X concentrations that are typically much higher than those normally found in the ambient air may increase acute respiratory illnesses in children and increase the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may aggravate eyes and mucus membranes and cause pulmonary dysfunction.

State and Federal standards were not exceeded between 2001 and 2005. The MDAB is designated as an attainment area for State and Federal NO_2 standards.

Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, and is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. Some particles are large or dark enough to be seen as soot or smoke; others are so small that they can be detected only with an electron microscope. PM_{10} particles are less than or equal to 10 microns in aerodynamic diameter; $PM_{2.5}$ particles are less than or equal to 2.5 microns in aerodynamic diameter, and are a subset (portion) of PM_{10}.

In the western United States, there are sources of PM_{10} in both urban and rural areas. PM_{10} and $PM_{2.5}$ are emitted from stationary and mobile sources, including diesel trucks and other motor vehicles, power plants, industrial processing, wood-burning stoves and fireplaces, wildfires, dust from roads, construction, landfills, agriculture, and fugitive windblown dust.

PM_{10} and $PM_{2.5}$ particles are small enough to be inhaled into, and lodge in, the deepest parts of the lung. Health problems begin as the body reacts to these foreign particles. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility and soiling of buildings.

The State standard for PM_{10} is 50 micrograms per cubic meter ($\mu g/m^3$) averaged over 24 hours; this standard was exceeded twice between 2001 and 2005. The Federal standard for PM_{10} is 150 $\mu g/m^3$ averaged over 24 hours; this standard was not provided. The MDAB is designated as a nonattainment area for State PM_{10} standards. Based upon a desire to set clean air goals throughout the State, the CARB created a new annual average standard for $PM_{2.5}$ at 12 $\mu g/m^3$. Currently, the

CARB has issued a staff report that recommends that the MDAB be designated as nonattainment for State and Federal $PM_{2.5}$ standards.[1]

Sulfur Dioxide

Sulfur dioxide is a colorless, pungent gas belonging to the family of sulfur oxide gases (SO_X), formed primarily by combustion of sulfur-containing fossil fuels (primarily coal and oil) metal smelting and other industrial processes. Sulfur dioxide (often used interchangeably with sulfur oxides [SO_X]) did not exceed Federal or State standards between 2001 and 2005. The MDAB is designated as an attainment area for both State and Federal SO_2 standards.

The major health concerns associated with exposure to high concentrations of SO_X are effects on breathing, respiratory illness, diminishment of pulmonary defenses, and aggravation of existing cardiovascular disease. Major subgroups of the population that are most sensitive to SO_X are individuals with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema), as well as children and the elderly. Emissions of SO_X also can damage the foliage of trees and agricultural crops. Together, SO_X and NO_X are the major precursors to acid rain, which is associated with the acidification of lakes and streams, and the accelerated corrosion of buildings and public monuments. Sulfur oxides can react to form sulfates, which significantly reduce visibility.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern in Southern California. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset conditions. Health effects of TACs include cancer, birth defects, neurological damage and death. The ten TACs posing the greatest health risk in California are acetaldehyde, benzene, 1-3 butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchlorethylene, and diesel particulate matter.

California regulates TACs through its Air Toxics Program, mandated in Chapter 3.5 - Toxic Air Contaminants of the Health and Safety Code (H&SC Section 39660 et. seq.) and Part 6 - Air Toxics “Hot Spots” Information and Assessment (H&SC Section 44300 et. seq.).

CARB is working in conjunction with the Office of Environmental Health Hazard Assessment (OEHHA), in order to identify potential sources of TACs. Air toxic control measures may then be adopted to reduce ambient concentrations of the identified toxic air contaminant below a specific threshold based on its effects on

[1] U.S. Environmental protection Agency (EPA), *Fine Particle ($PM_{2.5}$) Designations* web site: http://www.epa.gov/pmdesignations/documents/120/table.htm.

health, or to the lowest concentration achievable through use of best available control technology for toxics (T-BACT). The program is administered by CARB. Air quality control agencies, including the MDAQMD, must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by CARB.

The regulatory approach used in controlling TAC levels relies on a quantitative risk assessment process rather than on ambient air conditions to determine allowable emissions from the source. In addition, for carcinogenic air pollutants, there is no safe concentration in the atmosphere. Local concentrations can pose a significant health risk and are termed "toxic hot spots."

Reactive Organic Gases and Volatile Organic Compounds

Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including reactive organic gases (ROGs) and volatile organic compounds (VOCs). ROGs comprise all hydrocarbons except those exempted by the CARB. Therefore, ROGs are a set of organic gases based on State rules and regulations. VOCs are similar to ROGs in that they comprise all organic gases except those exempted by federal law. VOCs are therefore a set of organic gases based on federal rules and regulations. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions and paint (via evaporation).

The health effects of hydrocarbons result from the formation of ozone and its related health effects. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons are considered toxic air contaminants ("air toxics"). There are no separate health standards for VOCs, although some VOCs are also toxic; an example is benzene, which is both a VOC and a carcinogen.

SENSITIVE RECEPTORS

Sensitive populations are more susceptible to the effects of air pollution than are the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors are residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent center, and retirement homes. The Project area is surrounded by sensitive receptors within a one-mile radius; refer to Table 5.2-2, *Sensitive Receptors in the Project Vicinity*. As indicated in Table 5.2-2, the Project is directly adjacent to residential neighborhoods, schools, parks, and healthcare facilities.

5.2.2 REGULATORY SETTING

Regulatory oversight for air quality in the MDAB rests with the Mojave Desert Air Quality Management District at the regional level, the California Air Resources Board

at the State level, and the U.S. Environmental Protection Agency (EPA) Region IX office at the Federal level.

Table 5.2-2
Sensitive Receptors in the Project Vicinity

Type	Name	Distance from Project Site (miles)[1]	Direction from Project Site
Residential	Various	0.25 – 1.0	Various
Schools	Yucca Valley Elementary School	≤ 0.50	Southeast
	Yucca Valley Adventist Team School	≤ 1.0	Southeast
	Yucca Valley Christian School	0.0	Within Planning Area
	Yucca Valley High School	≤ 0.25	South
Parks	Yucca Valley Park	≤ 0.50	South
	Blue Skies Country Club	≤ 0.25	Northwest
	Desert Christ Park	≤ 1.0	North
Religious Centers	Church of the Nazarene	≤ 0.50	North
	Yucca Valley Foursquare Church	≤ 0.25	South

Source: http://maps.google.com
1. Sensitive receptor populations utilized in this analysis are those within a one-mile radius of the Project site.

U.S. ENVIRONMENTAL PROTECTION AGENCY

The principal air quality regulatory mechanism at the federal level is the Clean Air Act (CAA) and, in particular, the 1990 amendments to the Federal Clean Air Act (FCAA) and the National Ambient Air Quality Standards (NAAQS) that it establishes. These standards identify levels of air quality for "criteria" pollutants that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare. The criteria pollutants are ozone, carbon monoxide, nitrogen dioxide (NO_2 is a form of NO_X), sulfur oxides (SO_2 is a form of SO_x), particulate matter less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively) and lead (Pb); refer to Table 5.2-3, *National and California Ambient Air Quality Standards*. The EPA also has regulatory and enforcement jurisdiction over emission sources beyond State waters (outer continental shelf) and those that are under the exclusive authority of the Federal government, such as aircraft, locomotives and interstate trucking.

CALIFORNIA AIR RESOURCES BOARD

The CARB, a department of the California Environmental Protection Agency (CalEPA), oversees air quality planning and control throughout California. Its responsibility lies with ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the FCAA requirements and regulating emissions from motor vehicles sold in California. It also sets fuel specifications to further reduce vehicular emissions.

The amendments to the CCAA establish California Ambient Air Quality Standards (CAAQS) and a legal mandate to achieve these standards by the earliest practicable date. These standards apply to the same criteria pollutants as the FCAA and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride; refer to Table 5.2-3.

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT

Air districts have the primary responsibility to control air pollution from all sources other than those directly emitted from motor vehicles, which are the responsibility of the CARB and the EPA. Air districts adopt and enforce rules and regulations to achieve State and federal ambient air quality standards and enforce applicable State and Federal law.

On July 1, the former San Bernardino County Air Pollution Control District became the Mojave Desert Air Quality Management District, an autonomous agency under local control. As stated before, the MDAQMD has jurisdiction over the desert portion of San Bernardino County and the far eastern end of Riverside County. This region includes the incorporated communities of Adelanto, Apple Valley, Barstow, Blythe, Hesperia, Needles, Twentynine Pines, Victorville, and Yucca Valley.

The portion of the Southeast Desert Modified Air Quality Maintenance Area (SDMAQMA) has been given a Severe-17 non-attainment designation by the U.S. EPA for ozone. This area includes the Coachella Valley/San Jacinto region in Riverside County, the Victor Valley/Barstow region in San Bernardino County (which includes the project site) and the Antelope Valley region in Los Angeles County. The U.S. EPA designated this area as Severe-17 on the basis of a 0.24 ppm ozone value measured in Banning, California.

The Severe-17 designation requires the MDAQMD to implement a program to reach the ozone standard by November 15, 2007. In order to comply with Federal Regulations, the MDAQMD developed the *Post 1996 Attainment Demonstration and Reasonable Further Progress Plan* (ADP), adopted October 26, 1994, which provides an update to the efforts utilized to meet the State and Federal standards. The ADP concludes that the Federal ozone standard will be met in 2007, as a result of emission reduction in the South Coast Air Basin (SCAB). An Urban Airshed Model (UAM) evaluation was conducted by the South Coast Air Quality Management District (SCAQMD) to demonstrate this. Adding in the effect of the emission reduction identified by the MDAQMD in the ADP, results in the reduction of peak ozone concentrations from 12 parts per million (ppm) down to six to nine ppm.

In 2004, the MDAQMD adopted the *2004 Ozone Attainment Plan* (*Attainment Plan*) to update the previous ADP. The MDAQMD has adopted enforceable emission limitations, has a monitoring system in place throughout the populated portions of the Federal Ozone Non-Attainment Area (FONA), maintains a permit program (including a New Source Review program with an ambient air quality modeling requirement), and has performed an attainment demonstration using air quality modeling. The *Attainment Plan* incorporates all reasonably available control measures (all such measures have already been adopted for the FONA) and include a comprehensive, accurate and current inventory of actual emissions. The *Attainment Plan* also

documents reasonable further progress for the applicable periodic milestone dates (2007).

Table 5.2-3
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California[1]		Federal[2]	
		Standard[3]	Attainment Status	Standards[4]	Attainment Status
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m³)	**Extreme Nonattainment**	NA[5]	NA[5]
	8 Hours	0.07 (137 μg/m³)	Unclassified	0.08 ppm (157 μg/m³)	**Sever 17 Nonattainment**
Particulate Matter (PM_{10})	24 Hours	50 μg/m³	**Nonattainment**	150 μg/m³	**Serious Nonattainment**
	Annual Arithmetic Mean	20 μg/m³	**Nonattainment**	50 μg/m³	**Serious Nonattainment**
Fine Particulate Matter ($PM_{2.5}$)	24 Hours	No Separate Standard		65 μg/m³	**Nonattainment**
	Annual Arithmetic Mean	12 μg/m³	**Nonattainment**	15 μg/m³	**Nonattainment**
Carbon Monoxide (CO)	8 Hours	9.0 ppm μg/m³	Attainment	9 ppm (10 μg/m³)	**Nonattainment[6]**
	1 Hour	20 ppm (23μg/m³)	Attainment	35 ppm (40 μg/m³)	**Nonattainment[6]**
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	NA	NA	0.053 ppm (100 μg/m³)	Attainment
	1 Hour	0.25 ppm (470 μg/m³)	Attainment	NA	NA
LEAD (Pb)	30 days average	1.5 μg/m³	Attainment	NA	NA
	Calendar Quarter	NA	NA	1.5 μg/m³	Attainment
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	NA	NA	0.030 ppm (80 μg/m³)	Attainment
	24 Hours	0.04 ppm (105 μg/m³)	Attainment	0.14 ppm (365 μg/m³)	Attainment
	3 Hours	NA	NA	NA	Attainment
	1 Hour	0.25 μg/m³	Attainment	NA	NA
Visibility-Reducing Particles	8 Hours (10 a.m. to 6 p.m., PST)	Extinction coefficient = 0.23 km@<70% RH	Unclassified	**No Federal Standards**	
Sulfates	24 Hour	25 μg/m³	Attainment		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m³)	Unclassified		

Source: California Air Resources Board and U.S. Environmental Protection Agency, 2005.

μg/m³ = micrograms per cubic meter; ppm = parts per million; km = kilometer(s); RH = relative humidity; PST = Pacific Standard Time; NA = Not Applicable

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter-PM_{10}, 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. In 1990, the CARB identified vinyl chloride as a Toxic Air Contaminant and determined that there was not sufficient available scientific evidence to support the identification of a threshold exposure level. This action allows the implementation of health-protective control measures at levels below the 0.010 ppm ambient concentration specified in the 1978 standard.
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. EPA also may designate an area as *attainment/unclassifiable* if (1) monitored air quality data show that the area has not violated the ozone standard over a three-year period; or (2) there is not enough information to determine the air quality in the area. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over the three years, are equal to or less than the standard. 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.
3. Concentration is 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 mm of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
5. The Federal 1-hour ozone standard was revoked on June 15, 2005.
6. Technically, the Basin is in attainment for CO, however, has not been designated by EPA.

STATE AIR TOXICS PROGRAM

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern in Southern California. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating, commercial operations such as gasoline stations and dry cleaners, and motor vehicle engine exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset (spill) conditions. Health effects of TACs include cancer, birth defects, neurological damage, and death.

California regulates toxic air contaminants through its air toxics program, mandated in Chapter 3.5 (Toxic Air Contaminants) of the Health and Safety Code (H&SC Section 39660 et. seq.) and Part 6 (Air Toxics "Hot Spots" Information and Assessment) (H&SC Section 44300 et. seq.). The CARB, working in conjunction with the State Office of Environmental Health Hazard Assessment, identifies TACs. Air toxic control measures may then be adopted to reduce ambient concentrations of the identified TAC to below a specific threshold, based on its effects on health, or to the lowest concentration achievable through use of best- available control technology for toxics (T-BACT). The program is administered by the CARB. Air quality control agencies, including the MDAQMD, must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by CARB.

The Air Toxics "Hot Spots" Information and Assessment Act, codified in the Health and Safety Code, requires operators of specified facilities in the MDAQMD to submit to the MDAQMD comprehensive emissions inventory plans and reports by specified dates (H&SC Section 39660 et. seq. and Section 44300 et. seq.). The MDAQMD reviews the reports and then places the facilities into high-intermediate-, and low-priority categories, based on the potency, toxicity, quantity, and volume of hazardous emissions and on the proximity of potential sensitive receptors to the facility. Facilities designated as high priority (Category A) must prepare a health risk assessment (HRA). If the HRA finds a significant risk, the surrounding population must be notified. The emissions inventory data are to be updated every two years.

The CARB in 1998 identified diesel engine particulate matter as a TAC. Mobile sources (including trucks, buses, automobiles, trains, ships, and farm equipment) are by far the largest source of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the particles, and because diesel particles are very small, they penetrate deeply into the lungs. Diesel engine particulate matter is a human carcinogen. The cancer risk from exposure to diesel exhaust may be much higher than the risk associated with any other toxic air pollutant routinely measured in the region.

Before California listed particulate matter from diesel engine exhaust as a TAC, it had already adopted various regulations that would reduce diesel emissions. These regulations include new standards for diesel engine fuel; exhaust emission standards for new diesel trucks, buses, autos, and utility equipment; and inspection and maintenance requirements for health duty vehicles. Since listing diesel exhaust as a TAC, the CARB has been evaluating what additional regulatory action is needed to reduce public exposure. The CARB does not anticipate banning diesel fuel or engines; however, it may consider additional requirements for diesel fuel and engines, as well as other measures to reduce public exposure.

5.2.3 IMPACT THRESHOLDS AND SIGNIFCANCE CRITERIA

CEQA SIGNIFICANCE CRITERIA

In accordance with CEQA, the effects of a project are evaluated to determine whether they would result in a significant impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to avoid or lesson any significant impacts that are identified. The criteria (standards) used to determine the significance of impacts may vary, depending on the nature of the project. Air quality impacts resulting from implementation of the proposed Project could be considered significant if they would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Create objectionable odors affecting a substantial number of people.

STANDARDS-BASED THRESHOLDS[2]

MDAQMD *CEQA and Federal Conformity Guidelines* establish thresholds for pollutant emissions generated both during and following construction.

Criteria Pollutants

For purposes of this air quality analysis, actions that violate Federal standards for criteria pollutants (i.e., primary standards designed to safeguard the health of people considered to be sensitive receptors, and outdoor and secondary standards designed to safeguard human welfare) are considered significant impacts.

[2] Mojave Desert Air Quality Management District, *California Environmental Quality Act* (*CEQA) and Federal Conformity Guidelines,* May 2006.

Additionally, actions that violate State standards developed by the CARB or criteria developed by the MDAQMD, including thresholds for criteria pollutants, are considered significant impacts. Table 5.2-4, *Construction and Operational Air Emissions Thresholds*, provides the thresholds set forth by the MDAQMD.

Table 5.2-4
Construction and Operational Air Emissions Thresholds

Criteria Pollutant	Annual Threshold (tons)	Daily Thresholds (lbs)
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NO_x)	25	137
Volatile Organic Compounds (VOCs)	25	137
Oxides of Sulfur (SO_X)	25	137
Particulate Matter (PM_{10})	15	82

Source: Mojave Desert Air Quality Management District, *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines*, May 2006.

A project must incorporate mitigation sufficient to reduce its impact to a less than significant level. A project that cannot be mitigated to a level that is less than significant is required to incorporate all feasible mitigation. It should be noted that the emission thresholds are given as a daily value and an annual value, so that a multi-phased project (such as a project with a construction phase and a separate operational phase) with phases shorter than one year can be compared to the daily value.

5.2.4 IMPACTS AND MITIGATION MEASURES

SHORT-TERM AIR QUALITY IMPACTS

- **SHORT-TERM CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROPOSED PROJECT COULD RESULT IN SIGNIFICANT AIR POLLUTANT EMISSIONS IMPACTS.**

Impact Analysis: Construction activities produce combustion emissions from various sources including demolition, site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling, and motor vehicles transporting the construction crew. The use of construction equipment on-site would result in localized vehicular exhaust emissions. Vehicular exhaust emissions during site construction would vary as construction activity levels change.

Table 5.2-5, *Land Use Plan Buildout Summary*, includes the anticipated development associated with the implementation of the Project. The development and/or redevelopment of the Old Town Yucca Valley Specific Plan Project area would be a multi-year effort and is envisioned to occur over a 20-year period. Future development and/or redevelopment in the Project area would be dependent on and responsive to prevailing market conditions. Therefore, at this stage, construction

information is not available. Construction activities were therefore not quantified using the URBEMIS 2002 air quality model, but were discussed qualitatively below.[3]

Table 5.2-5
Project Land Use Plan Summary

District and Land Use Type(s)	Old Town Yucca Valley Specific Plan Buildout	
	Dwelling Units	Square Feet
Old Town Mixed-Use		
Commercial/Retail - up to 1.00 FAR; Residential – up to 40 du/ac	465	759,317
Old Town Highway Commercial		
Commercial/Retail – up to 0.35 FAR; Residential – none	0	889,684
Old Town Commercial/Residential		
Commercial/Retail – up to 0.40 FAR; Residential – up to 24 du/ac	413	699,769
Old Town Industrial/Commercial		
Industrial/Commercial – up to 0.40 FAR; Res. – up to 30 du/ac	238	551,834
TOTALS	**1,115**	**2,900,604**

Source: RBF Consulting, *Old Town Yucca Valley Specific Plan*, May 5, 2006.
Note: FAR = Floor Area Ratio; du/acre = Dwelling Units per Acre.

Fugitive Dust and Construction Equipment Emissions

Federal, State, and local development standards and requirements designed to minimize air quality emissions would be implemented through standard development procedures. These measures typically include the following:

- Water exposed soils at least twice daily and maintain equipment and vehicle engines in good condition and in proper tune;
- Wash-off trucks leaving development sites;
- Replace ground cover on construction sites if it is determined that the site will be undisturbed for lengthy periods;
- Reduce speeds on unpaved roads to less than 15 miles per hour;
- Halt all grading and excavation operations when wind speeds exceed 25 miles per hour;
- Properly maintain diesel-powered on-site mobile equipment;

[3] Construction methodology approach developed pursuant to a telephone conversation between Maria Cadiz of RBF Consulting and Alan DeSalvio of the Mohave Desert Air Quality Management District, August 10, 2006.

- Install particulate filters on off-road construction equipment;
- Sweep streets at the end of the day if substantial visible soil material is carried over to the adjacent streets; and
- Cover all trucks hauling dirt, sand, soil or other loose material to and from the site.

Fugitive dust is a major concern for areas in the MDAB. Implementation of the Project would include considerable construction activities, which could potentially result in exceedances of MDAQMD PM_{10} standards. Since the proposed Project is currently in the programmatic stage, it is not possible to quantify impacts associated with fugitive dust. Therefore, based on the size of the proposed project and in consultation with the MDAQMD, it is anticipated that impacts regarding fugitive dust would be significant and unavoidable. All future projects within the Specific Plan would be required to adhere to all feasible mitigation measures to minimize fugitive dust emissions. Feasible mitigation measures include those listed in Mitigation Measures AQ-1 and AQ-2. Implementation of mitigation measures would reduce fugitive dust impacts; however, impacts would remain significant and unavoidable.

Reactive Organic Gas and Volatile Organic Compound Emissions

In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates ROG emissions, which are ozone precursors. Future development within the Project area would be required to adhere to the MDAQMD Rule 1113, *Architectural Coatings*, which provides stipulations on painting and coating activities; refer to Mitigation Measure AQ-5.

Toxic Air Contaminants

Diesel particulate matter is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is commonly found throughout the environment and is estimated by EPA's National Scale Assessment to contribute to human health risk. Diesel exhaust has two phases, gas and particle, and both phases contribute to the risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde and polycyclic aromatic hydrocarbons. The particle phase also has many different types of particles that can be classified by size or composition. The size of diesel particulates that are of greatest health concern are those in the categories of fine and ultrafine particles. The composition of these fine and ultrafine particles may be elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines, including light and heavy-duty equipment.

Toxic air contaminants are not expected to be a significant source of pollution from construction activities. Health risk assessments (HRA) for diesel particulate matter (DPM) are typically conducted for areas that would expose sensitive receptors to high concentrations of DPM over a long period of time. Typically, per the California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Pollution Control Officers Association (CAPCOA) guidelines, estimating cancer risk

for DPM is not required for construction activities, as they occur for a short period of time and therefore would not measurably increase cancer risk. The Project area would be developed per market demand in phased increments.

Per MDAQMD guidance, TAC and DPM modeling is not warranted.[4] However, in order to reduce impacts associated with TAC and DPM, the proposed Project would be required to implement Mitigation Measures AQ-3 and AQ-4. Mitigation Measure AQ-3 includes procedures such as properly maintaining mechanical equipment and shutting down idling equipment. Mitigation Measure AQ-4 requires that a "Diesel Fuel Reduction Plan" be implemented, which includes measures such as using low sulfur or other alternative fuel.

Asbestos

Project construction activities may include the demolition of buildings that were constructed prior to 1980. These structures may contain friable asbestos, which has been identified as a hazardous airborne contaminant. Regulations are already in place, which require demolition activities to minimize asbestos released into the air. Primarily, this is accomplished through the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP). The EPA through the CARB and the MDAQMD enforces this NESHAP.

The asbestos NESHAP specifies work practices to be followed during demolition of all structures that contain, or may contain asbestos (MDAQMD District Rule 1000, National Emissions Standards for Hazardous Air Pollutants). These work practices have been designed to effectively reduce airborne asbestos to safe levels. The proposed Project would be subject to the asbestos NESHAP, and thus would be required to comply with these specified work practices. Additionally, demolition activities would be subject to MDAQMD Rule 306, *Demolition and Renovation Project Fees*, and Rule 1000, *National Emissions Standards for Hazardous Air Pollutants*. Consequently, airborne asbestos would not be generated in unhealthy amounts during demolition.

Odors

Potential odors generated during construction operations would be temporary and are concluded to result in less than significant impacts. Note that emissions produced during grading and construction activities are short-term, as they occur only for the duration of construction.

Mitigation Measures:

AQ-1 During clearing, grading, earth-moving, or excavation operations, excessive fugitive dust emissions shall be controlled by regular watering or other dust preventive measures using the following procedures, as specified by the MDAQMD, including but not limited to MDAQMD Rule 401, *Visible Emissions*, and Rule 403 *Fugitive Dust*:

[4] Ibid.

- On-site vehicle speed shall be limited to 15 miles per hour;
- All on-site construction roads with vehicle traffic shall be watered periodically;
- Streets adjacent to the Project's reach shall be swept as needed to remove silt that may have accumulated from construction activities so as to prevent excessive amounts of dust;
- All material excavated or graded shall be sufficiently watered to prevent excessive amounts of dust. Watering shall occur at least twice daily with complete coverage, preferably in the late morning and after work is done for the day;
- All clearing, grading, earth-moving, or excavation activities shall cease during periods of high winds (i.e., greater than 35 miles per hour averaged over one hour) so as to prevent excessive amounts of dust;
- All material transported on-site or off-site shall be either sufficiently watered or 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; and
- These control techniques shall be indicated on project grading plans. Compliance with this measure shall be subject to periodic site inspections by the Town of Yucca Valley.

AQ-2 All trucks hauling excavated or graded material on-site shall comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2) and (e)(4), as amended, regarding the prevention of such material spilling onto public streets.

AQ-3 During construction activities, excessive construction equipment and vehicle exhaust emissions shall be controlled by implementing the following procedures, as specified by the MDAQMD:

- Properly and routinely maintain all construction equipment, as recommended by manufacturer manuals, to control exhaust emissions;
- Shut down equipment when not in use for extended periods of time to reduce emissions associated with idling engines;
- Encourage ride sharing and use of transit transportation for construction employee commuting to the Project sites;
- Use electric equipment for construction whenever possible in lieu of fossil fuel-fired equipment; and

- Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing construction activity during the peak-hour of vehicular traffic on adjacent roadways.

AQ-4 Prior to approval of the project plans and specifications, the Public Works Director, or his designee, shall confirm that the construction bid packages include a separate "Diesel Fuel Reduction Plan." This plan shall identify the actions to be taken to reduce diesel fuel emissions during construction activities (inclusive of grading and excavation activities). Reductions in diesel fuel emissions can be achieved by measures including, but not limited to, the following: a) use of alternative energy sources, such as compressed natural gas or liquefied petroleum gas, in mobile equipment and vehicles; b) use of "retrofit technology," including diesel particulate trips, on existing diesel engines and vehicles; and c) other appropriate measures. Prior to the issuance of a grading permit, the Diesel Fuel Reduction Plan shall be filed with the Town of Yucca Valley. The Diesel Fuel Reduction Plan shall include the following provisions:

- All diesel fueled off-road construction equipment shall be California Air Resources Board (CARB) certified or use post-combustion controls that reduce pollutant emissions to the same level as CARB certified equipment. CARB certified off-road engines are engines that are three years old or less and comply with lower emission standards. Post-combustion controls are devices that are installed downstream of the engine on the tailpipe to treat the exhaust. These devices are now widely used on construction equipment and are capable of removing over 90 percent of the PM_{10}, carbon monoxide, and volatile organic compounds from engine exhaust, depending on the specific device, sulfur content of the fuel, and specific engine. The most common and widely used post-combustion control devices are particulate traps (i.e., soot filters), oxidation catalysts, and combinations thereof.

- All diesel fueled on-road construction vehicles shall meet the emission standards applicable to the most current year to the greatest extent possible. To achieve this standard, new vehicles shall be used or older vehicles shall use post-combustion controls that reduce pollutant emissions to the greatest extent feasible.

- The effectiveness of the latest diesel emission controls is highly dependant on the sulfur content of the fuel. Therefore, diesel fuel used by on-road and off-road construction equipment shall be low sulfur (>15 ppm) or other alternative low polluting diesel fuel formulation.

AQ-5 The construction contractor shall adhere to MDAQMD District Rule 1113 (Architectural Coatings) to limit volatile organic compounds from architectural coatings. This rules specifies architectural coatings storage, clean up and labeling requirements.

AQ-6 All building demolition activities shall adhere to MDAQMD District Rule 306 (Demolition and Renovation Project Fees) and Rule 1000 (National Emissions Standards for Hazardous Air Pollutants). Additionally, the demolished material shall be transported off-site expeditiously after demolition of the structure.

Level of Significance: Significant and Unavoidable With Mitigation Incorporated.

LONG-TERM OPERATIONAL IMPACTS

- **DEVELOPMENT ASSOCIATED WITH THE PROPOSED PROJECT WOULD RESULT IN SIGNIFICANT AIR EMISSIONS IMPACTS.**

Impact Analysis: For purposes of this air quality emissions analysis, operational related air quality impacts were studied for 2030 buildout. Long-term air quality impacts would consist of mobile source emissions generated from Project-related traffic and from stationary source emissions generated directly from natural gas. Emissions associated with each of these sources are discussed and calculated below.

Mobile Source Emissions

Based on the *Traffic Impact Analysis*, the proposed Project would generate 107,463 net daily trips above existing conditions. Mobile sources are emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, VOCs, NO_X, SO_X, and PM_{10} are all pollutants of regional concern; (NO_X and VOCs react with sunlight to form O_3 [photochemical smog], and wind currents readily transport SO_X and PM_{10}). However, CO tends to be a localized pollutant, dispersing rapidly at the source.

Project-generated vehicle emissions have been estimated using the URBEMIS 2002 computer model. This model predicts VOCs, CO, NO_X, SO_X, and PM_{10} emissions from motor vehicle traffic associated with new or modified land uses; refer to Appendix 15.4, *Air Quality Data*, for model input values used for this Project. Project trip generation rates were based on the *Old Town Yucca Valley Specific Plan CMP Traffic Impact Analysis;* refer to Section 5.1, *Traffic and Circulation*, and Appendix 15.3, *Traffic Impact Analysis*. Table 5.2-6, *Year 2030 Project Operational Emissions*, presents anticipated mobile source (vehicle) emissions.

Area Source Emissions

Area source emissions were estimated using a variety of sources including the URBEMIS 2002 model, along with generally accepted emission factors for certain stationary sources. While previous versions of URBEMIS 2002 were designed to estimate emissions only from motor vehicle trips, the current version can estimate emissions from gas heaters, furnaces, and landscape maintenance equipment. The model accounts for specific meteorological conditions and topography that characterize each air basin in California. Electricity and natural gas are utilized by

almost every residential development. As indicated in Table 5.2-6, area source emissions alone would not exceed established MDAQMD thresholds.

Table 5.2-6
Year 2030 Project Operational Emissions[1]

Emissions	Pollutant (pounds/day)[1]				
	ROG/VOC	NO_X	CO	SO_X	PM_{10}
• Area Source Emissions[2] • Mobile Source (Vehicle) Emissions	140.47 192.73	38.07 276.98	61.00 2,259.69	0.22 7.28	0.18 1,299.38
Total Emissions	333.19	315.06	2,320.69	7.50	1,299.56
MDAQMD Threshold	137	137	548	137	82
Is Threshold Exceeded? (Significant Impact?)	***Yes***	***Yes***	***Yes***	***No***	***Yes***

ROG = reactive organic gases; VOC = volatile organic compounds; NO_X = nitrogen oxides; CO = carbon monoxide; SOX = sulfur oxides; PM10 = particulate matter.

1. Based on URBEMIS 2002 modeling results, worst-case seasonal emissions for area and mobile emissions have been modeled.
2. Area Source emissions exclude the use of fireplaces and wood burning stoves.

Total Project Operational Emissions: Area and Mobile Sources

The total Project operational emissions are described in terms of area source and mobile source (vehicle) emissions. Transportation control measures and design features can be incorporated into the Project to reduce emissions from mobile sources. Mitigation Measure AQ-7 has been recommended to reduce area source emissions and potential sources of ROG emissions. However, as indicated in Table 5.2-6, operational emissions would still exceed the MDAQMD thresholds in regards to VOCs, NO_X, CO, and PM_{10}. Thus, the Project would result in significant and unavoidable impacts for long-term operations under for Year 2030 conditions.

Health Effects

The proposed Project would result in significant and unavoidable impacts associated with emissions of VOCs, NO_X, CO, and PM_{10}. As previously noted (Local Ambient Air Quality), these criteria pollutants have been known to cause health related problems to humans. The following provides some discussion on the types of health effects associated with Project air emissions:

- Ozone (O_3) – High concentrations of ground level ozone can adversely affect the human respiratory system and other tissues. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels.

- Carbon Monoxide (CO) – CO enters the bloodstream and binds more readily to hemoglobin than oxygen, reducing the oxygen-carrying capacity of blood, thus reducing oxygen delivery to organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected, but only at higher levels of exposure. Carbon monoxide binds strongly to hemoglobin, the oxygen-carrying protein in blood, and thus reduces the blood's capacity for carrying oxygen to the heart, brain, and other parts of the body. At high concentrations, CO can

cause heart difficulties in people with chronic diseases, and can impair mental abilities. Typically, CO is a localized pollutant and does not disperse far from the source.

- Nitrogen Oxides (NO_X) – NO_X can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza.

- Particulate Matter (PM_{10} and $PM_{2.5}$) – Are small enough to be inhaled into, and lodged in, the deepest parts of the lung. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, coughing, bronchitis and respiratory illnesses in children.

- Volatile Organic Compounds (VOCs) – The primary health effects of hydrocarbons result from the formation of ozone and its related health effects. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement.

Localized CO Hotspots

Carbon monoxide emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthy levels (i.e., adversely affect residents, school children, hospital patients, the elderly, etc.).

To identify CO hotspots, the MDAQMD follows the SCAQMD criterion, which requires an analyst to perform a CO microscale hotspot analysis when a project increases the volume-to-capacity ratio (also called the intersection capacity utilization) by 0.02 (two percent) for any intersection with an existing level of service (LOS) D or worse. Because traffic congestion is highest at intersections where vehicles queue and are subject to reduced speeds, these hot spots are typically produced at intersection locations. Per the *Old Town Yucca Valley Specific Plan CMP Traffic Impact Analysis*, full buildout of the Project would warrant a CO hotspot at the following intersections:

- Camino Del Cielo Trail and SR-62;
- Kickapoo Trail and SR-62;
- Kickapoo Trail and Santa Fe Trail;
- Pioneertown Road and SR-62;
- Deer Trail and Santa Fe Trail;
- Mohawk Trail/Acoma Trail and SR-62;
- Church Street and SR-62;
- Palm Avenue South and SR-62;
- Palm Avenue North and SR-62;
- Sage Avenue and Onaga Trail;
- Old Woman Springs Road (SR-247) and Paxton Road;
- Old Woman Springs Road (SR-247)/Joshua Lane and SR-62;
- Joshua Lane and Yucca Trail;
- Joshua Lane and Onaga Trail;

- Warren Vista Avenue and Yucca Trail;
- Palomar Avenue and Yucca Trail;
- Indio Avenue and SR-62;
- Indio Avenue South and Yucca Trail; and
- Indio Avenue North and Yucca Trail.

The PM peak hour results in higher intersection capacity utilization (ICU) and was used in the modeling process. Future CO projections are modeled using the existing lane configurations and do not include the improvements discussed in the traffic analysis.[5] The projected traffic volumes were then modeled using the CALINE4 dispersion model and the resultant values were added to an ambient concentration. The ambient concentration used in the modeling was the highest one-hour measurement from the past five years of MDAQMD. Actual future ambient CO levels may be lower due to emissions control strategies that would be implemented between now and the Project buildout date. As indicated in Table 5.2-7, *Project Buildout Carbon Monoxide Concentrations*, CO levels would be well below the State standard of 20 ppm for the 1-hour Standards and 9 ppm for the 8-hour standards. Therefore impacts associated with CO levels would be less than significant.

Table 5.2-7
Project Buildout Carbon Monoxide Concentrations

Intersection	1-Hour CO (ppm)		8-Hour CO (ppm)	
	1-Hour Standard	Future Year	8-Hour Standard	Future Year
Camino Del Cielo Trail and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Kickapoo Trail and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Kickapoo Trail and Santa Fe Trail	20 ppm	2.6 ppm	9 ppm	1.8 ppm
Pioneertown Road and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Deer Trail and Santa Fe Trail	20 ppm	2.6 ppm	9 ppm	1.8 ppm
Mohawk Trail/Acoma Trail and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Church Street and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Palm Avenue South and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Palm Avenue North and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Sage Avenue and Onaga Trail	20 ppm	2.6 ppm	9 ppm	1.8 ppm
Old Woman Springs Road (SR-247) and Paxton Road	20 ppm	2.6 ppm	9 ppm	1.8 ppm
Old Woman Springs Road (SR-247)/Joshua Lane and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Joshua Lane and Yucca Trail	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Joshua Lane and Onaga Trail	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Warren Vista Avenue and Yucca Trail	20 ppm	2.6 ppm	9 ppm	1.8 ppm
Palomar Avenue and Yucca Trail	20 ppm	2.6 ppm	9 ppm	1.8 ppm
Indio Avenue and SR-62	20 ppm	2.7 ppm	9 ppm	1.9 ppm
Indio Avenue South and Yucca Trail	20 ppm	2.6 ppm	9 ppm	1.8 ppm
Indio Avenue North and Yucca Trail	20 ppm	2.6 ppm	9 ppm	1.8 ppm

ppm = parts per million.

1. As measured at a distance of 10 feet from the corner of the intersection predicting the highest value. Presented 1-hour CO concentrations include a background concentration of 2.5 ppm. Eight-hour concentrations are based on a persistence of 0.7 of the 1-hour concentration.
2. The State 1-hour standard is 20 ppm. The Federal standard is 35 ppm. The most stringent standard is reflected in the Table.
3. The State 8-hour and Federal 8-hour standard is 9 ppm.

[5] It is noted that the existing lane configurations are considered a more conservative approach.

Odors

Depending on the end user, odors could potentially be generated. Odor is strongest at its source and dissipates with increasing distance. The offensiveness and degree of odor is ultimately dependent on the sensitivity of the receptors exposed to the odor. Temperature, wind, dust conditions, topography, and the presence of physical obstructions affect the degree of odor impacts on nearby sensitive receptors. Odor compounds travel further in warm climates than in relatively cooler climates. During windy conditions, odor compounds are diluted with fresh air and, consequently, disperse more quickly and are less noticeable at a distance. However, wind direction also defines the direction of travel for odors. Physical obstructions, such as windbreaks, cause more rapid dilution of odorous compounds and also capture odor-containing fugitive dust.

It is not anticipated that the Project would result in odor impacts to the surrounding area, as the Project primarily consists of residential and commercial uses, which are generally not considered odor generators. The proposed Project would include some industrial land uses, however all future developments would adhere to MDAQMD District Rule 401, *Nuisance*, which prohibits any quantities of air contaminants or other material which may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Thus a less than significant impact would occur in this regard.

Mitigation Measures:

AQ-7 Proposed development within the Old Town Yucca Valley Specific Plan areas shall include, as a part of construction and building management contracts, the following requirements or measures shown to be equally effective:

- Use solar or low-emission water heaters in the residential buildings.
- Provide energy-efficient natural gas heating and cooking equipment.
- Require that residential landscapers providing services at the common areas of a Project site use electric or battery-powered equipment, or other internal combustion equipment that is either certified by the California Air Resources Board or is three years old or less at the time of use, to the extent that such equipment is reasonably available and competitively priced in San Bernardino County (meaning that the equipment can be easily purchased at stores in San Bernardino County and the cost of the equipment is not more than 20 percent greater than the cost of standard equipment).

Level of Significance: Significant and Unavoidable With Mitigation Incorporated.

CONFORMITY WITH AIR QUALITY MANAGEMENT PLAN

- **DEVELOPMENT ASSOCIATED WITH THE PROPOSED PROJECT WOULD BE INCONSISTENT WITH REGIONAL PLANS.**

Impact Analysis: According to the *MDAQMD CEQA and Federal Conformity Guidelines,* a project is non-conforming if conflicts with or delays implementation of any applicable attainment or maintenance plan. A project is conforming if it complies with all applicable rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plans, and is consistent with the growth forecasts in the applicable plans. Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast.

Although the Project would represent an incremental negative impact to air quality in the MDAB, of primary concern is that Project-related impacts have been properly anticipated in the regional air quality planning process and reduced whenever feasible. Therefore, it is necessary to assess the Project's consistency with the applicable attainment or management plan. The proposed Project is covered under the *MDAQMD 2004 Ozone Attainment Plan* (*Attainment Plan*). The *Attainment Plan* bases its assumptions on growth forecasts contained in the Yucca Valley *General Plan* and is utilized by the MDAQMD in budgeting the MDAB emissions. Therefore, in order to analyze consistency with the *Attainment Plan*, a comparison study was performed to determine impacts associated with implementation of the Specific Plan over the existing Town of Yucca Valley *General Plan* land designations.

Table 5.2-8, *Land Use Plan Buildout Summary*, indicates the proposed Project would increase the number of residential units by 1,088 and decrease commercial/industrial uses by 478,435 square feet. Based on the assumptions provided in Table 5.2-8, trip generation rates were also generated for future buildout of the existing *General Plan* (without the proposed Project); refer to Table 5.2-9, *Trip Generation Rate Summary*. As shown in Table 5.2-9, buildout of the existing *General Plan* would result in approximately 105,457 daily trips, while the proposed Project would generate 107,463 daily trips. The proposed Project would therefore result in an increase 2,006 daily trips above the *General Plan* Buildout assumptions. Thus, the proposed Project would include a more intense use of the Project area.

Potential buildout of 1,115 dwelling units within the SPA would cause an increase in the Town's population projection as compared to the existing *General Plan*. The Specific Plan buildout net change from the *General Plan* would create an additional 1,088 residential units within the SPA. Based on an estimate of 2.517 persons per household,[6] buildout of the Specific Plan would result in a potential population of approximately 2,806 persons, which is approximately 2,738 additional persons beyond what would be anticipated for the SPA based on the existing General Plan.[7]

[6] State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2006, with 2000 Benchmark. Sacramento, California, May 2006.

[7] Note: This calculation uses only residential units to predict future population, which is the most accurate method available at this time.

Table 5.2-8
Land Use Buildout Summary

District and Land Use Type(s)	Existing General Plan		Old Town Yucca Valley Specific Plan Buildout		Specific Plan Buildout Net Change From General Plan	
	Dwelling Units	Square Feet	Dwelling Units	Square Feet	Dwelling Units	Square Feet
Old Town Mixed-Use						
Commercial/Retail - up to 1.00 FAR; Residential – up to 40 du/ac	0	208,812	465	759,317	465	550,505
Old Town Highway Commercial						
Commercial/Retail – up to 0.35 FAR; Residential – none	16	1,194,444	0	889,684	(16)	(304,760)
Old Town Commercial/Residential						
Commercial/Retail – up to 0.40 FAR; Residential – up to 24 du/ac	11	1,113,542	413	699,769	402	(413,773)
Old Town Industrial/Commercial						
Industrial/Commercial – up to 0.40 FAR; Res. – up to 30 du/ac	0	862,241	238	551,834	238	(310,407)
TOTALS	**27**	**3,379,039**	**1,115**	**2,900,604**	**1,088**	**(478,435)**

Source: RBF Consulting, *Old Town Yucca Valley Specific Plan*, May 5, 2006.
Note: FAR = Floor Area Ratio; du/acre = Dwelling Units per Acre.

Table 5.2-9
Trip Generation Rate Summary

Scenario	AM Peak Hour			PM Peak Hour			Daily Trips
	Inbound	Outbound	Total	Inbound	Outbound	Total	
Existing General Plan	4,485	1,535	6,020	3,892	9,780	105,457	105,457
Proposed Project	4,333	1,811	6,144	4,145	5,824	9,969	107,463
Specific Plan Buildout Net Change from General Plan							2,006

Source: Urban Crossroads, August 16, 2006.

Based on the trip generation rates and proposed land uses under the Specific Plan, quantitative emissions analysis was conducted using the URBEMIS 2002 model. Results of the air quality modeling are presented in Table 5.2-10, *Operational Emissions Comparison*. As indicated in Table 5.2-10, the proposed Project would increase emissions in the area by 95.13 lbs/day for VOCs, 24.73 lbs/day for NO_x, 116.89 lbs/day for CO, 0.46 lbs/day for SO_x, and 44.13 lbs/day for PM_{10}. Therefore, implementation of the proposed Specific Plan would result in an increase of forecast General Plan buildout emissions for the Town of Yucca Valley. This increase in emissions above *General Plan* buildout was not included with the latest MDAQMD *Attainment Plan*. Therefore, impacts would be considered significant and unavoidable in regards to consistency with the latest *Attainment Plan*.

Table 5.2-10
Operational Emissions Comparison

Emissions	Pollutant (pounds/day)[1]				
	ROG/VOC	NO_X	CO	SOX	PM10
Existing General Plan Buildout					
• Area Source Emissions[2] • Mobile Source (Vehicle) Emissions	51.49 186.57	22.29 268.04	20.64 2183.16	0.01 7.03	0.05 1,255.39
Total Emissions	238.06	290.33	2,203.80	7.04	1,255.43
MDAQMD Threshold	137	137	548	137	82
Is Threshold Exceeded? (Significant Impact?)	***No***	***Yes***	***Yes***	***No***	***Yes***
Old Town Valley Specific Plan Buildout					
• Area Source Emissions[2] • Mobile Source (Vehicle) Emissions	140.47 192.73	38.07 276.98	61.0 2,259.69	0.22 7.28	0.18 1299.38
Total Emissions	333.19	315.06	2,320.69	7.50	1,299.56
MDAQMD Threshold	137	137	548	137	82
Is Threshold Exceeded? (Significant Impact?)	***No***	***Yes***	***Yes***	***No***	***Yes***
Net Increase					
Specific Plan Buildout Net Emissions above General Plan Forecast	95.13	24.73	116.89	0.46	44.13

ROG = reactive organic gases; VOC = volatile organic compounds; NO_X = nitrogen oxides; CO = carbon monoxide; SOX = sulfur oxides; PM10 = particulate matter.

1. Based on URBEMIS 2002 modeling results, worst-case seasonal emissions for area and mobile emissions have been modeled.
2. Area Source emissions exclude the use of fireplaces and wood burning stoves.

Mitigation Measures: No mitigation measures are recommended.

Level of Significance: Significant and Unavoidable Impact.

5.2.5 CUMULATIVE IMPACTS

- **DEVELOPMENT ASSOCIATED WITH THE PROPOSED PROJECT AND RELATED CUMULATIVE PROJECTS WOULD RESULT IN SIGNIFICANT AIR QUALITY IMPACTS.**

Impact Analysis: The MDAQMD classifies cumulative impacts as direct and indirect project emissions. If a project related air quality impact is individually less than significant, the impacts of reasonably anticipated future activities, probable future projects, and past projects are included based on similar air quality impacts, transport considerations and geographic location. Currently the MDAQMD's approach towards assessing cumulative impacts is based on the fact that the MDAQMD *Attainment Plan* forecasts attainment of ambient air quality standards in accordance with the requirements of the CCAA, which takes into account the San Bernardino County Association of Governments (SANBAG) forecasted future regional growth. Therefore, if all projects are individually consistent with the growth assumptions within the MDAQMD's *Attainment Plan*, then future development would not impeded the attainment of ambient air quality standards. As indicated under the *Long-Term Operational Emissions* and *Conformity With Air Quality Management Plan* discussions, the proposed Project would result in exceedances of MDAQMD standards for criteria pollutants under long-term operations. Furthermore, the proposed Project would include an increase in daily trips compared to the existing

General Plan land use designations. As a result, the proposed Project would be inconsistent with the anticipated emissions in the *Attainment Plan*. Therefore, the proposed Project would result in a significant and unavoidable cumulatively significant impact.

Mitigation Measures: No mitigation measures are recommended.

Level of Significance: Significant and Unavoidable Impact.

5.2.6 SIGNIFICANT UNAVOIDABLE IMPACTS

Despite compliance with mitigation measures, emissions during construction would remain above MDAQMD thresholds.

Implementation of the operational Mitigation Measures would be partially effective in reducing impacts of area source emissions. However, this measure would not substantially reduce the projected increase in emission levels below MDAQMD significance thresholds. Thus, impacts related to regional pollutants (VOCs, CO, NO_x, and PM_{10}) would be significant and unavoidable. Impacts related to local CO concentrations would be less than significant.

This increase in Project related emissions above *General Plan* buildout forecasts was not included with the latest MDAQMD *Attainment Plan*. Therefore, impacts related to consistency with the latest *Attainment Plan* would be significant and unavoidable.

Cumulative regional operational impacts related to regional emissions would be significant and unavoidable, while cumulative local operational impacts related CO emissions would be less than significant.

If the Town of Yucca Valley approves the Project, the Town would be required to adopt findings in accordance with Section 15091 of the *CEQA Guidelines* and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the *CEQA Guidelines*.